



# SHEET REFERENCE NOTES

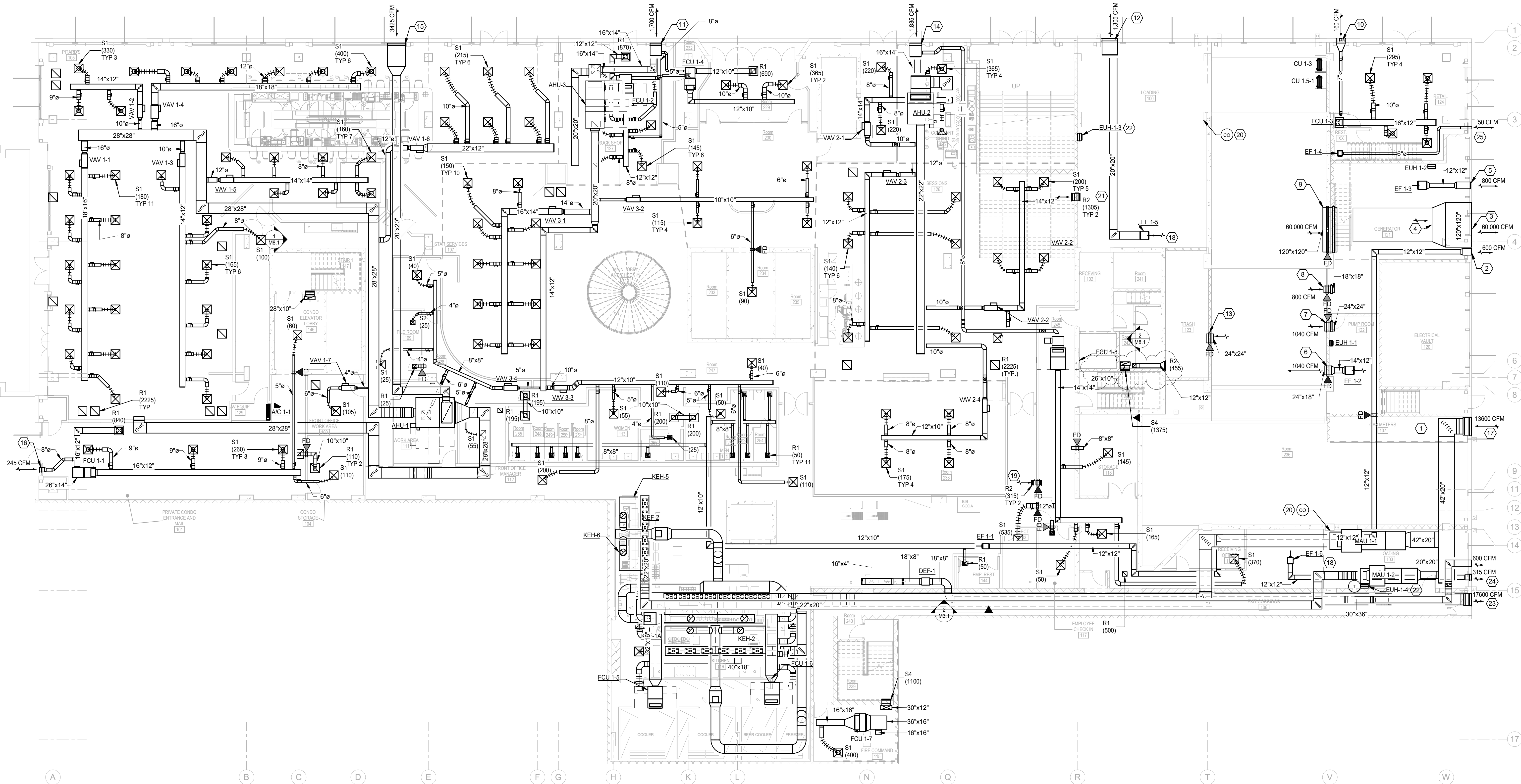
- 1 GAS METER ROOM SHALL HAVE A 5'-0" MINIMUM LOUVERED DOUBLE DOOR PER ENERGY REQUIREMENTS.
- 2 0.9 SF FREE AREA EXHAUST LOUVER IN EXTERIOR WALL. ROUTE EXHAUST DUCT TO CONNECT INTO EXTERIOR LOUVER SYSTEM.
- 3 ROUTE RADIATOR EXHAUST DUCT TO CONNECT INTO EXTERIOR LOUVER SYSTEM.
- 4 CONNECT DUCT TO RADIATOR. TRANSITION TO OPENING SIZE OF LOUVER.
- 5 1 SF FREE AREA EXHAUST LOUVER WITH MAX 0.1" WC PRESSURE DROP IN EXTERIOR WALL. ROUTE EXHAUST DUCT TO CONNECT INTO EXTERIOR LOUVER SYSTEM.
- 6 1.3 SF FREE AREA EXHAUST LOUVER SIZED FOR MAX 0.1" WC PRESSURE DROP. PROVIDE GRAVITY SHUTTER DAMPER ON THE BACK END OF UNIT.
- 7 1.3 SF FREE AREA MAKE UP AIR LOUVER SIZED FOR MAX 0.1" WC PRESSURE DROP. PROVIDE GRAVITY SHUTTER DAMPER ON THE BACK END OF UNIT.
- 8 1 SF FREE AREA MAKE UP AIR LOUVER WITH MAX 0.1" WC PRESSURE DROP. PROVIDE AUTOMATIC DAMPER TO THE BACK END OF THE UNIT. DAMPER SHALL BE INTERLOCKED TO OPEN WHEN GENERATOR AND/OR EXHAUST FAN IS ACTIVATED.
- 9 75 SF FREE AREA MAKE UP AIR LOUVER WITH MAX 0.1" WC PRESSURE DROP. LOUVER WILL CONSIST OF MULTIPLE SECTIONS WITH A MULLION. PROVIDE AUTOMATIC DAMPER TO THE BACK END OF THE UNIT. DAMPER SHALL BE INTERLOCKED TO OPEN WHEN GENERATOR IS ACTIVATED.

# SHEET REFERENCE NOTES

- 10 0.3 SF FREE AREA OUTSIDE AIR LOUVER WITH MAX .1" WC PRESSURE DROP IN EXTERIOR WALL. COORDINATE WITH ARCHITECTURAL.
- 11 2.2 SF FREE AREA OUTSIDE AIR LOUVER WITH MAX 0.1" WC PRESSURE DROP IN EXTERIOR WALL. COORDINATE WITH ARCHITECTURAL. PROVIDE SHEET METAL PLENUM OFF THE BACK OF THE LOUVER UNIT AS SHOWN.
- 12 1.65 SF FREE AREA EXHAUST AIR LOUVER WITH MAX .1" WC PRESSURE DROP AT 1305 CFM IN EXTERIOR WALL. COORDINATE WITH ARCHITECTURAL. PROVIDE SHEET METAL PLENUM OFF THE BACK OF THE LOUVER UNIT AS SHOWN.
- 13 0.4 SF FREE AREA MAKE UP AIR LOUVER WITH MAX 0.1" WC PRESSURE DROP IN EXTERIOR WALL. COORDINATE WITH ARCHITECTURAL. PROVIDE GRAVITY DAMPER ON BACK END OF UNIT.
- 14 2.3 SF FREE AREA MAKE UP AIR LOUVER WITH MAX 0.1" WC PRESSURE DROP IN EXTERIOR WALL. COORDINATE WITH ARCHITECTURAL. PROVIDE SHEET METAL PLENUM OFF THE BACK OF THE LOUVER UNIT AS SHOWN.
- 15 4.3 SF FREE AREA MAKE UP AIR LOUVER WITH MAX 0.1" WC PRESSURE DROP IN EXTERIOR WALL. COORDINATE WITH ARCHITECTURAL.
- 16 0.3 SF FREE AREA MAKE UP AIR LOUVER WITH MAX 0.1" WC PRESSURE DROP IN EXTERIOR WALL. COORDINATE WITH ARCHITECTURAL.
- 17 0.7 SF FREE AREA MAKE UP AIR LOUVER WITH MAX 0.1" WC PRESSURE DROP IN EXTERIOR WALL. COORDINATE WITH ARCHITECTURAL. PROVIDE SHEET METAL PLENUM OFF THE BACK OF THE LOUVER UNIT AS SHOWN.

# SHEET REFERENCE NOTES

- 18 INTERLOCK EXHAUST FAN WITH OVERHEAD DOOR. EXHAUST FAN SHALL RUN WHEN DOOR OVERHEAD DOOR IS CLOSED.
- 19 12"x18" TRANSFER OPENING WITH MOTORIZED DAMPER. PROVIDE TRANSFER GRILLE ON BOTH SIDES. INSTALL BOTTOM OF OPENING AT 0'-8" ABOVE RECEIVING FLOOR. INTERLOCK DAMPER SO THAT IT OPENS WHEN EF 1-6 IS ENERGIZED.
- 20 INSTALL CO SENSOR 6'-0" ABOVE FINISHED FLOOR. ROUTE WIRE FOR SENSOR IN METAL CONDUIT.
- 21 18"x36" TRANSFER OPENING WITH MOTORIZED DAMPER. PROVIDE TRANSFER GRILLE R2 ON BOTH SIDES. INSTALL OPENING WITHIN CEILING CAVITY OF ADJACENT SPACE. INTERLOCK DAMPER SO THAT IT OPENS WHEN EF-1-5 IS ENERGIZED.
- 22 INSTALL BOTTOM OF ELECTRIC WALL HEATER AT 8'-0" ABOVE FINISHED FLOOR.
- 23 0.4 SF FREE AREA LOUVER WITH MAX .1" WC PRESSURE DROP AT 315 CFM IN EXTERIOR WALL. COORDINATE WITH ARCHITECTURAL. PROVIDE SHEET METAL PLENUM OFF THE BACK OF THE LOUVER UNIT AS SHOWN.
- 24 22 SF FREE AREA KITCHEN EXHAUST LOUVER WITH MAX 0.1" WC PRESSURE DROP IN EXTERIOR WALL. COORDINATE WITH ARCHITECTURAL. PROVIDE SHEET METAL PLENUM OFF THE BACK OF THE LOUVER UNIT AS SHOWN.
- 25 .07 SF FREE AREA EXHAUST LOUVER WITH MAX 0.1" WC PRESSURE DROP IN EXTERIOR WALL. ROUTE EXHAUST DUCT TO CONNECT INTO EXTERIOR LOUVER SYSTEM.

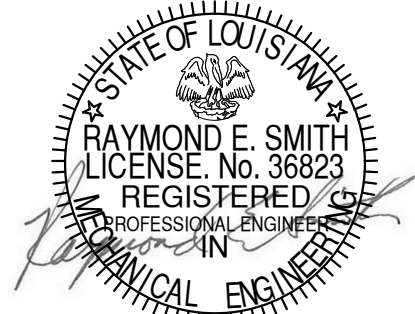


1 1ST FLOOR GROUND LEVEL - HVAC

SCALE: 3/32" = 1'-0"

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REVISION HISTORY	
05/18/18	
1	UPDATE

1ST FLOOR GROUND LEVEL - HVAC

PROJECT#: 1709  
PHASE: PERMIT  
TEAM: MEI  
CHECKER: RS  
SCALE: AS NOTED  
ISSUED: 06/05/2018



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HARD ROCK  
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NEW ORLEANS, LOUISIANA

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[illegible]

INTERMEDIATE PARKING  
HVAC

PROJECT#: 1709  
PHASE: PERMIT  
TEAM: MEI  
CHECKER: RS  
SCALE: AS NOTED  
ISSUED: 06/05/2018

**MOSES**  
ENGINEERS

**CONSULTING ENGINEERS**  
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Tel. 504-586-1725

## M1.2





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[illegible]

2ND FLOOR - HVAC

PROJECT#: 1709  
PHASE: PERMIT  
TEAM: MEI  
CHECKER: RS  
SCALE: AS NOTED  
ISSUED: 06/05/2018

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ENGINEERS

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## M1.2.1



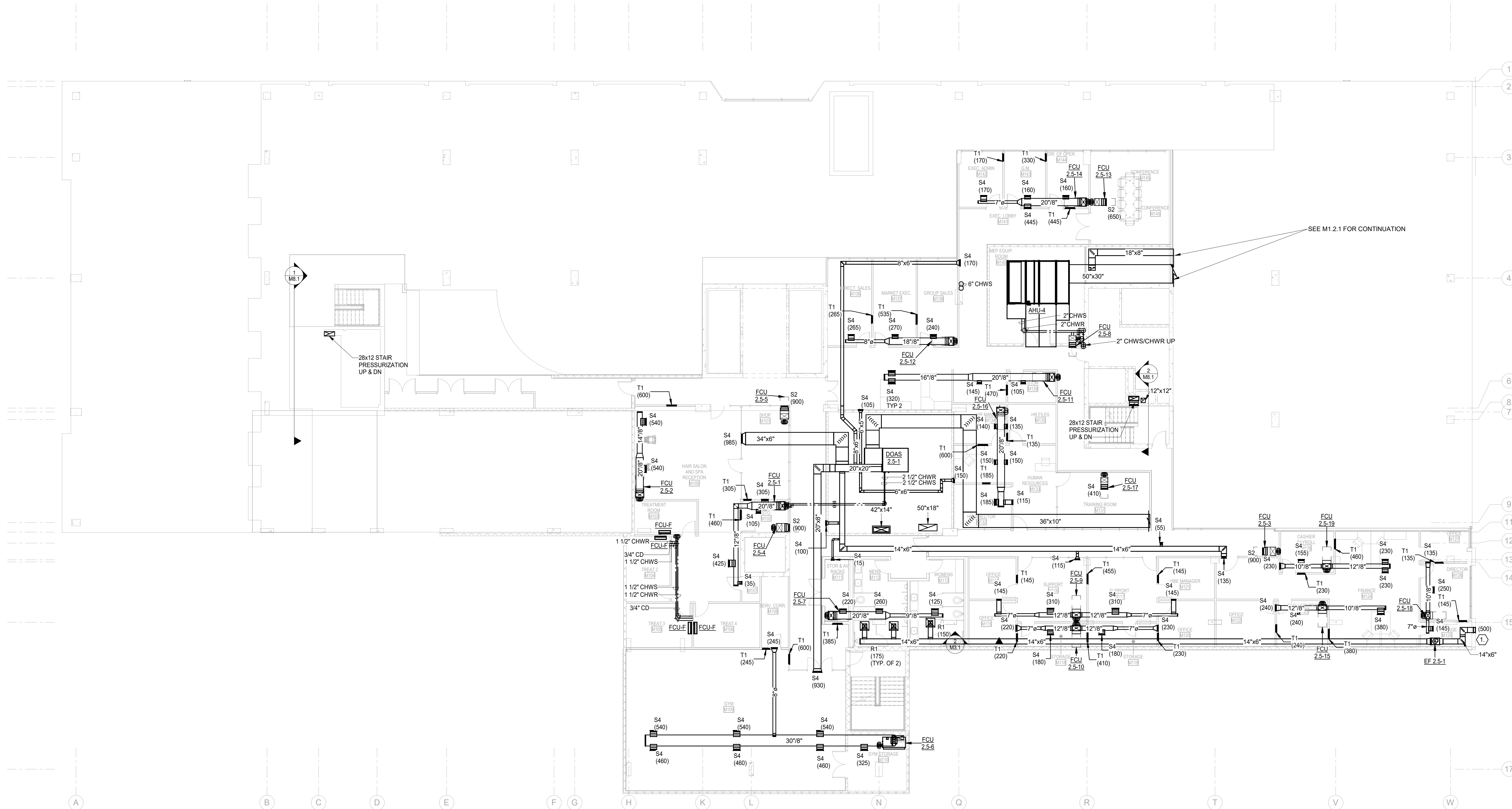
2ND FLOOR MEZZANINE  
HVAC

**MOSES**  
ENGINEERS

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## 1 2ND FLOOR MEZZANINE - HVAC

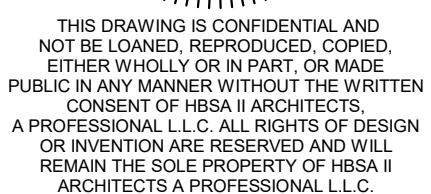
SCALE: 3/32" = 1'-0"



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3RD FLOOR ACCESSIBLE  
PARKING - HVAC

# MOSES

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# M1.3







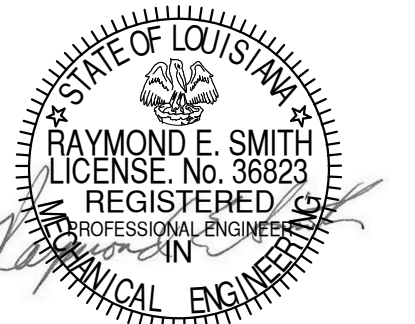
#	SHEET REFERENCE NOTES
1.	6.9 SF FREE AREA LOUVER WITH MAX 0.1" WC PRESSURE DROP IN EXTERIOR WALL. COORDINATE WITH ARCHITECTURAL.
2.	CONNECT CHWS AND CHWR PIPES TO UNIT AND ROUTE CONDENSATE TO NEAREST HUB DRAIN. COORDINATE WITH PLUMBING FOR LOCATION OF NEAREST HUB DRAIN. PROVIDE PUMP WHERE ELEVATION OF HUB DRAIN IS ABOVE DRAIN OUTLET ON THE UNIT. TYPICAL ALL HVAC UNITS.
3.	PROVIDE 2 HR SHIELD ENCLOSURE OR 2HR RATED DUCT ALTERNATIVE SUCH AS UNIFRAK PYRE WRAP OR EQUAL. 2 HR ENCLOSURE SHALL BE CONTINUOUS UP TO VERTICAL SHAFT ENCLOSURE.

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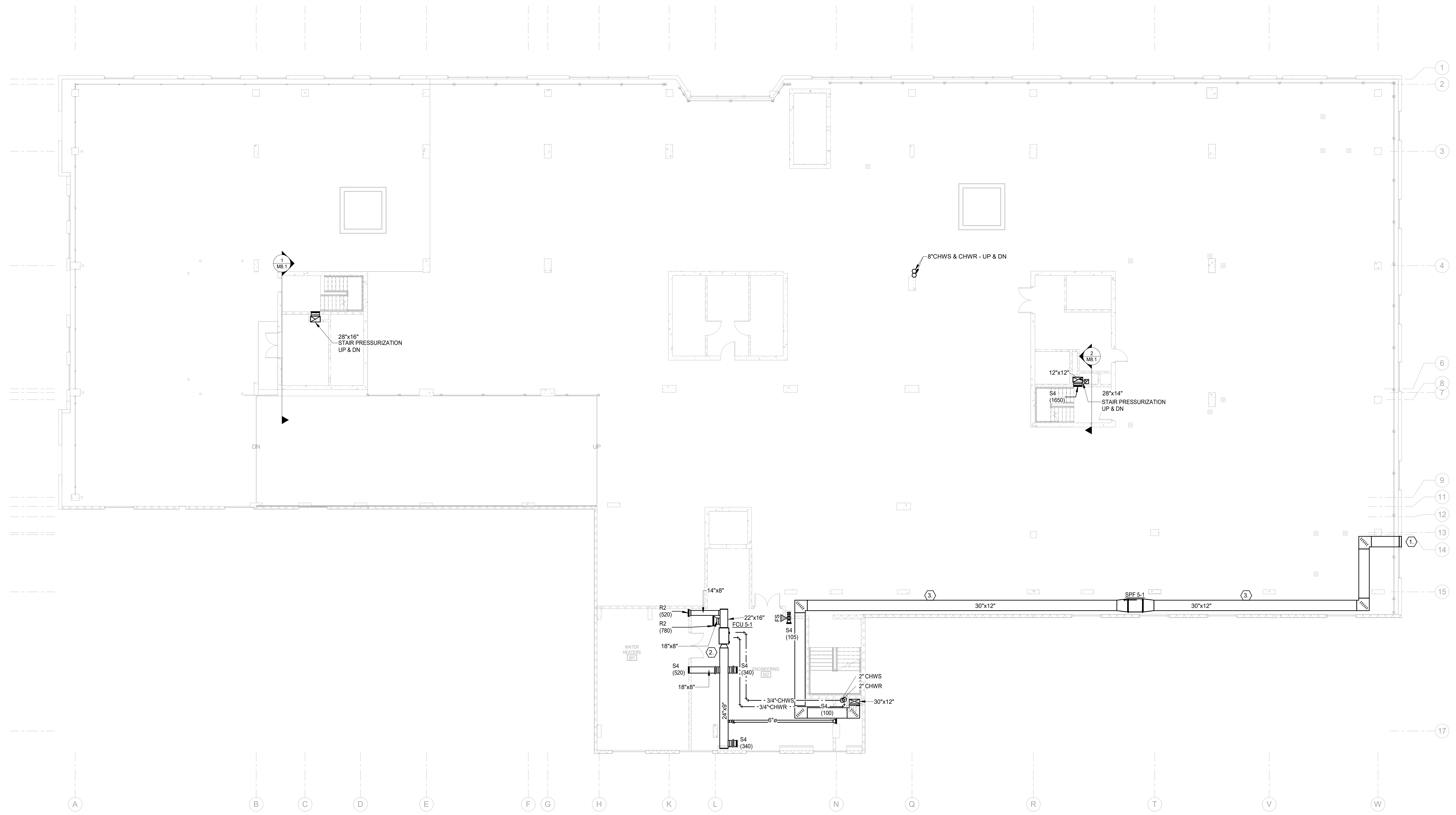
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[illegible]

5TH FLOOR PARKING -  
HVAC

PROJECT#: 1709  
PHASE: PERMIT  
TEAM: MEI  
CHECKER: RS  
SCALE: AS NOTED  
ISSUED: 06/05/2018

### M1.3.2



# 1 5TH FLOOR PARKING - HVAC

SCALE: 3/32" = 1'-0"

**MOSES**  
ENGINEERS

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1.	CONNECT CHWS AND CHWR PIPES TO UNIT AND ROUTE CONDENSATE TO NEAREST HUB DRAIN. COORDINATE WITH PLUMBING FOR LOCATION OF NEAREST HUB DRAIN. PROVIDE PUMP WHERE ELEVATION OF HUB DRAIN IS ABOVE DRAIN OUTLET ON THE UNIT. TYPICAL ALL HVAC UNITS.
----	---

HARD ROCK  
1031 CANAL STREET  
NEW ORLEANS, LOUISIANA

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## REVISION HISTORY


PROJECT#: 1709  
PHASE: PERMIT  
TEAM: MEI  
CHECKER: RS  
SCALE: AS NOTED  
ISSUED: 06/05/2018

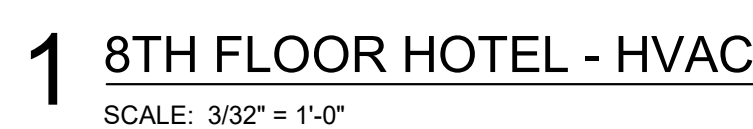
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### M1.3.3

SCALE: 3/32" = 1'-0"



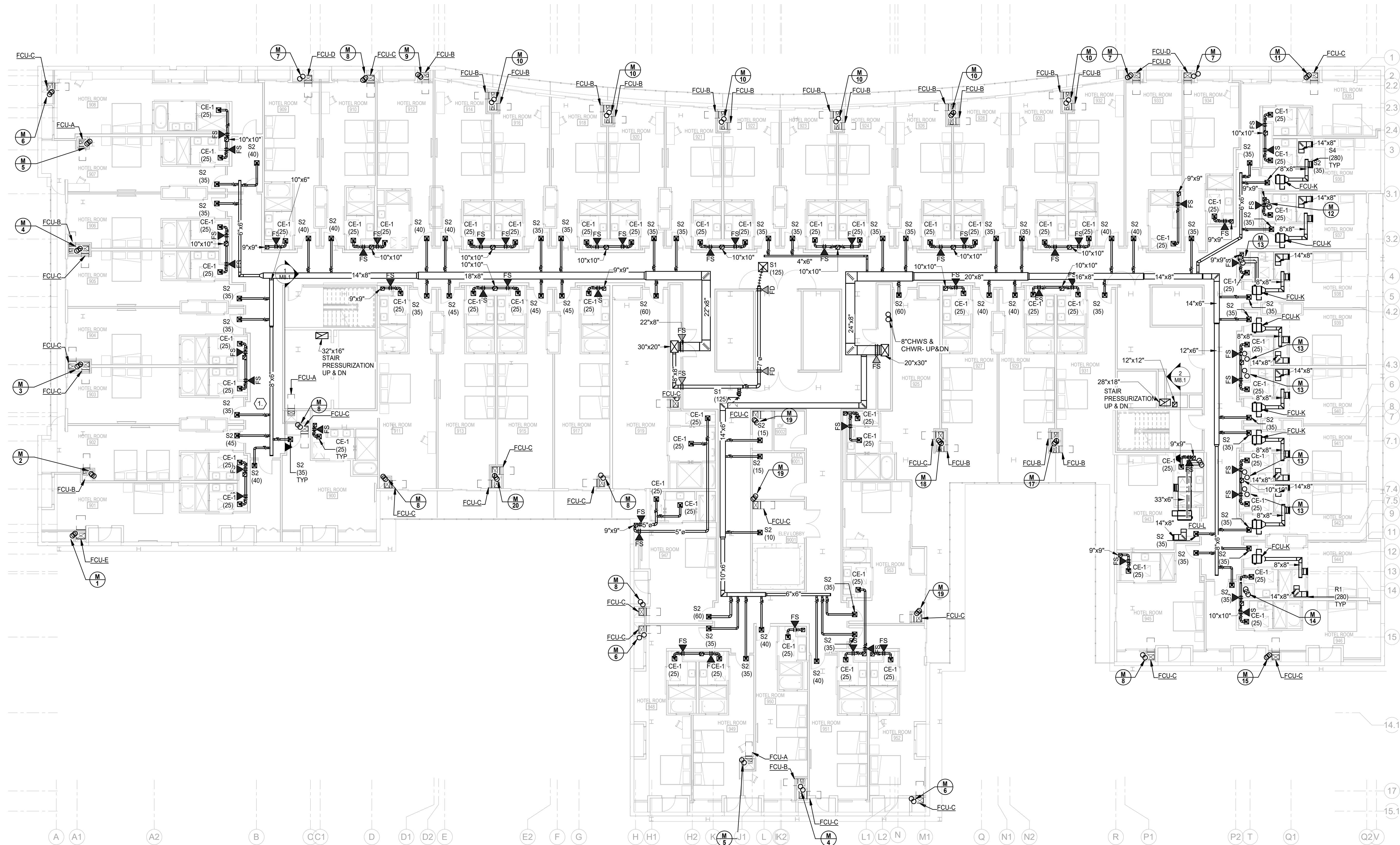




MOSES  
ENGINEERS

## M1.4

- PROJECT#: 1709  
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TEAM: MEI  
CHECKER: RS  
SCALE: AS NOTED  
ISSUED: 06/05/2018



SCALE: 3/32" = 1'-0"

1. COORDINATE LOCATIONS OF DAMPERS WITH ARCHITECT. PROVIDE ACCESS PANELS FOR DAMPERS ABOVE HARD CEILINGS. WHERE ACCESS PANELS WILL INTERFERE WITH AESTHETICS OF ARCHITECTURAL CEILING, PROVIDE REMOTE DAMPER OPERATOR FOR INACCESSIBLE DAMPERS. TYPICAL ALL DAMPERS.

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[illegible]

PROJECT#: 1709  
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TEAM: MEI  
CHECKER: RS  
SCALE: AS NOTED  
ISSUED: 06/05/2018

### M1.4.1



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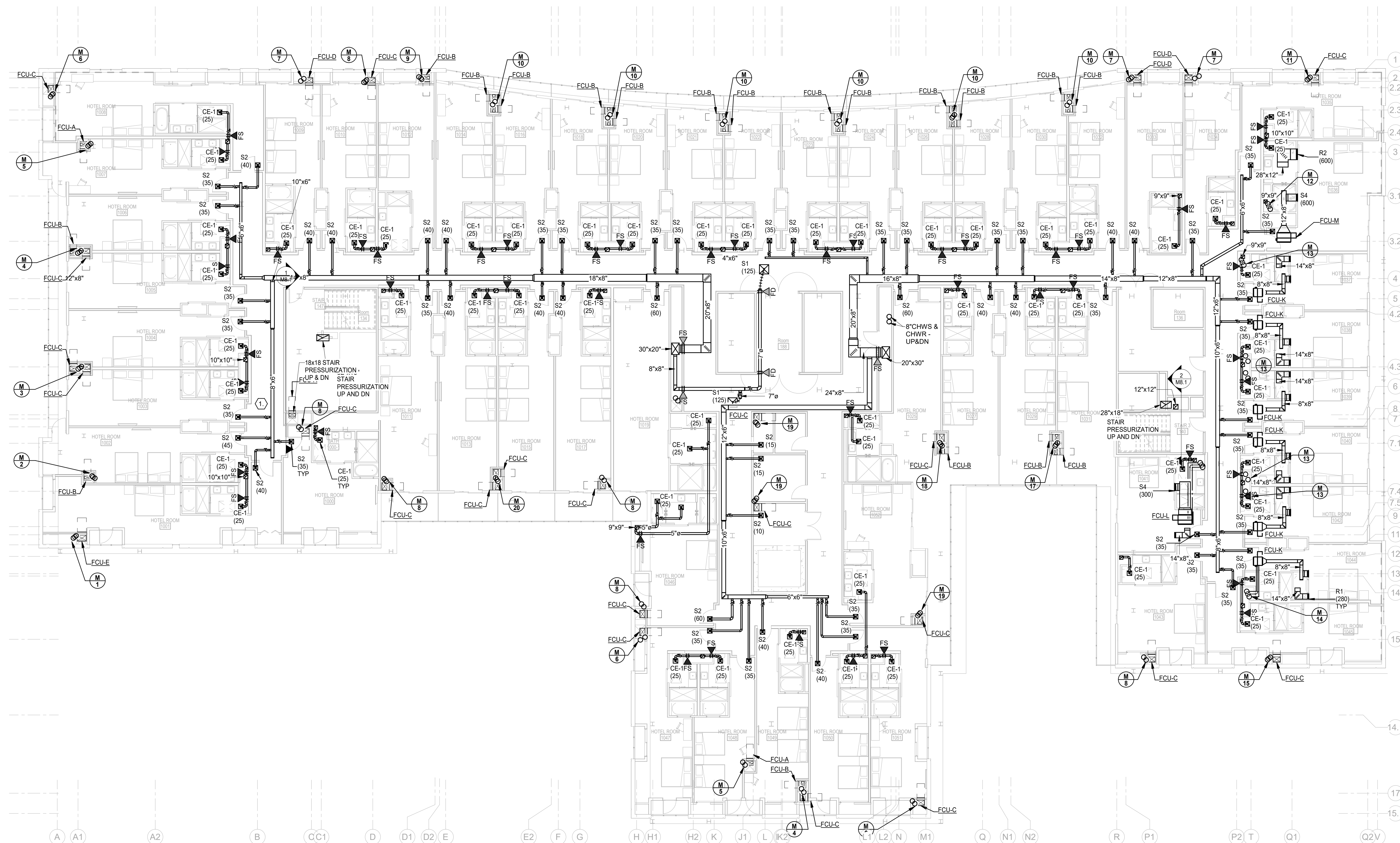
10TH - 12TH FLOORS  
HVAC

PROJECT#: 1709  
PHASE: PERMIT  
TEAM: MEI  
CHECKER: RS  
SCALE: AS NOTED  
ISSUED: 06/05/2018

## M1.4.2

## # SHEET REFERENCE NOTES

1. COORDINATE LOCATIONS OF DAMPERS WITH ARCHITECT. PROVIDE ACCESS PANELS FOR DAMPERS ABOVE HARD CEILINGS. WHERE ACCESS PANELS WILL INTERFERE WITH AESTHETICS OF ARCHITECTURAL CEILING, PROVIDE REMOTE DAMPER OPERATOR FOR INACCESSIBLE DAMPERS. TYPICAL ALL DAMPERS



## 1 10TH - 12TH FLOOR HOTEL - HVAC

SCALE: 3/32" = 1'-0"

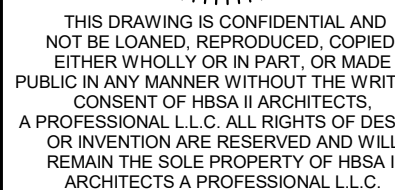
MOSES  
ENGINEERS

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1. COORDINATE LOCATIONS OF DAMPERS WITH ARCHITECT. PROVIDE ACCESS PANELS FOR DAMPERS ABOVE HARD CEILINGS. WHERE ACCESS PANELS WILL INTERFERE WITH AESTHETICS OF ARCHITECTURAL CEILING, PROVIDE REMOTE DAMPER OPERATOR FOR INACCESSIBLE DAMPERS. TYPICAL ALL DAMPERS.

HARD ROCK  
1031 CANAL STREET  
NEW ORLEANS, LOUISIANA

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13TH FLOOR - HVAC

### M1.4.3



SCALE: 3/32" = 1'-0"

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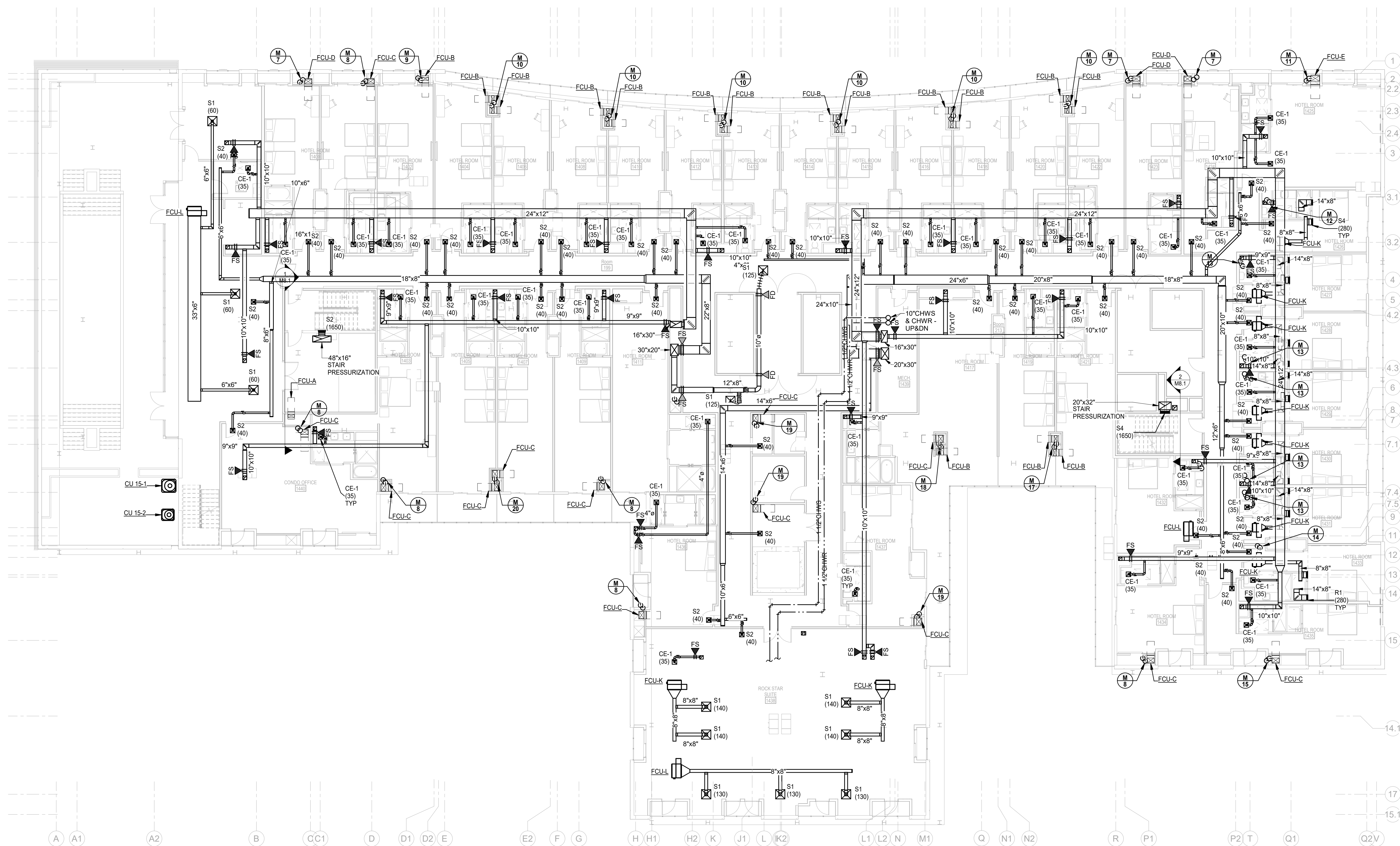
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ISSUED: 06/05/2018

## M1.4.4

1. COORDINATE LOCATIONS OF DAMPERS WITH ARCHITECT. PROVIDE ACCESS PANELS FOR DAMPERS ABOVE HARD CEILINGS. WHERE ACCESS PANELS WILL INTERFERE WITH AESTHETICS OF ARCHITECTURAL CEILING, PROVIDE REMOTE DAMPER OPERATOR FOR INACCESSIBLE DAMPERS. TYPICAL ALL DAMPERS.



SCALE: 3/32" = 1'-0"

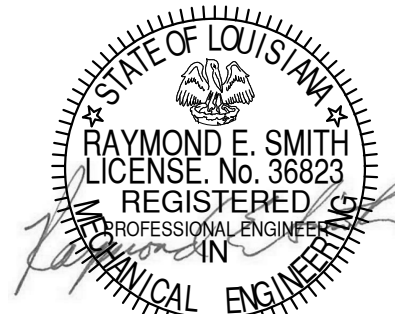
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[illegible]

15TH FLOOR - HVAC

PROJECT#: 1709  
PHASE: PERMIT  
TEAM: MEI  
CHECKER: RS  
SCALE: AS NOTED  
ISSUED: 06/05/2018

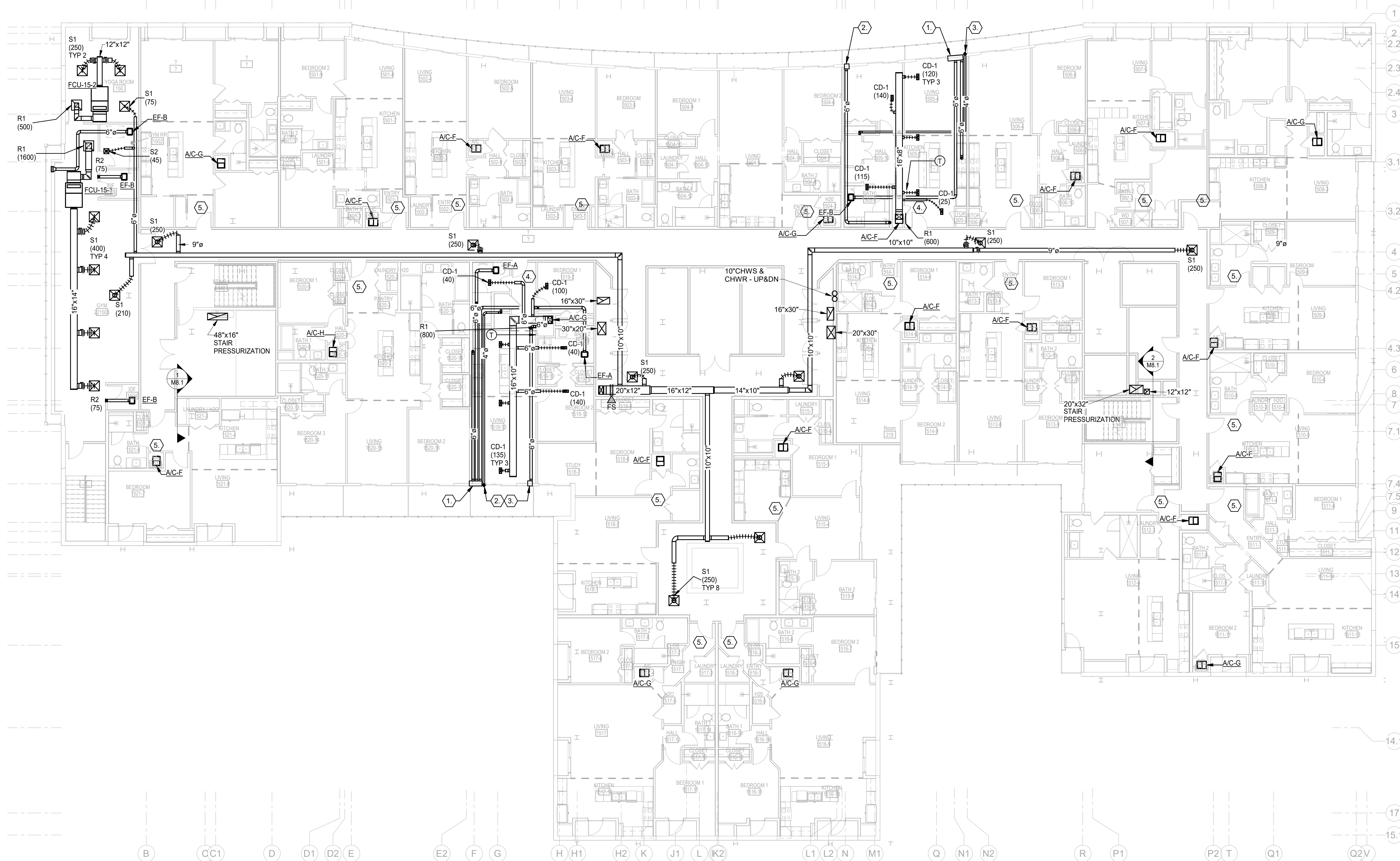
## M1.4.5

## # SHEET REFERENCE NOTES

1. TERMINATE KITCHEN AND BATHROOM EXHAUST DUCTS AT LOUVER ON EXTERIOR WALL. PROVIDE 12" DEEP PLENUM BOX FOR CONNECTING DUCTS TO LOUVER. LOUVER SHALL BE SIZED FOR MINIMUM 1 CFM FREE AREA AND VELOCITY OF 500 FPM OR LESS WHILE DISCHARGING 500 CFM. THE OVERALL PRESSURE DROP SHALL BE NO GREATER THAN 0.08 IN. W.G. LOUVER SIZE SHALL BE AS SELECTED BY ARCHITECT (APPROXIMATELY 12"x36").
2. PROVIDE SEIHO MODEL SFZC DRYER VENT TERMINAL WITH BACKDRAFT DAMPER, MOUNT WITHIN SHEET METAL PANEL ON BUILDING EXTERIOR. COORDINATE PANEL LOCATION AND SIZE WITH THE ARCHITECT.
3. TERMINATE VENTILATION DUCTS AT LOUVER ON EXTERIOR WALL. PROVIDE 12" DEEP PLENUM BOX FOR FREE AREA AND VELOCITY OF 500 FPM OR LESS WHILE INTAKE CFM MATCHING ON LISTED ON THE SCHEDULE FOR THE CORRESPONDING UNIT. THE OVERALL PRESSURE DROP SHALL BE NO GREATER THAN 0.08 IN. W.G. LOUVER SIZE SHALL BE AS SELECTED BY ARCHITECT (APPROXIMATELY 12"x36").

## # SHEET REFERENCE NOTES

4. DIFFUSERS LOCATED IN CONDO UNITS SHALL HAVE BALANCING DAMPERS AT THE DIFFUSER, OPERABLE AT THE DIFFUSER FACE, TO ELIMINATE THE NEED FOR ACCESS PANELS.
5. SEE CONDO 16 AND 20 ON THIS SHEET AND CONDO 1610 ON SHEET M1.4.4 FOR GENERAL HVAC LAYOUT OF CONDO UNITS. ALL CONDOS SHALL HAVE EXHAUST TO THE EXTERIOR WITH OUTSIDE AIR INTAKE AT THE EXTERIOR A MINIMUM 10 FEET AWAY FROM EXHAUST. SEE HVAC SCHEDULES FOR ACTUAL HVAC UNIT SIZE. SERVING EACH CONDO. PROVIDE EACH TOILET WITH AN EXHAUST FAN. PROVIDE EACH BEDROOM, FULL BATH, AND KITCHEN WITH AN EXHAUST FAN. PROVIDE LARGE CLOSETS AND LAUNDRY ROOMS SHALL ALSO HAVE SUPPLY AIR. MAKE ADJUSTMENTS TO AIRFLOW, DUCT SIZE, THERMOSTAT LOCATION, ETC. AS NECESSARY TO MEET THE SYSTEMS BASED ON DIFFERENCES IN TYPICAL CONDO VS CONDO BE CONSTRUCTED.



## 1 15TH FLOOR CONDOS - HVAC

SCALE: 3/32" = 1'-0"

MOSES  
ENGINEERS

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Tel. 504-586-1725



1. TERMINATE KITCHEN AND BATHROOM EXHAUST DUCTS AT LOUVER ON EXTERIOR WALL. PROVIDE 12" DEEP PLENUM BOX FOR CONNECTING DUCTS TO LOUVER. LOUVER SHALL BE SIZED FOR MINIMUM 1 SF FREE AREA AND VELOCITY OF 500 FPM. MATCHING O.D. OF EXHAUST DUCT SHALL BE NO GREATER THAN 0.06 IWC. LOUVER CFM SHALL BE NO GREATER THAN 0.08 IWC. LOUVER SIZE SHALL BE AS SELECTED BY ARCHITECT (APPROXIMATELY 12"X36").
2. PROVIDE SEIHO MODEL SF2Z DRYER VENT TERMINAL WITH BACKDRAFT DAMPER. MOUNT WITHIN SHEET METAL PANEL ON BUILDING EXTERIOR. COORDINATE WITH EXISTING VENTILATION SYSTEM.
3. TERMINATE VENTILATION DUCTS AT LOUVER ON EXTERIOR WALL. PROVIDE 12" DEEP PLENUM BOX FOR CONNECTING DUCT TO LOUVER. LOUVER SHALL BE SIZED FOR MINIMUM 0.16 SF FREE AREA AND VELOCITY OF 500 FPM OR LESS WITH INTAKE CFM MATCHING OA LISTED ON THE SCHEDULE FOR THE CORRESPONDING EXHAUST FAN. LOUVER FREE AREA SHALL BE NO GREATER THAN 0.06 IWC. LOUVER CFM SHALL BE AS SELECTED BY ARCHITECT (APPROXIMATELY 12"X12").

4. DIFFUSERS LOCATED IN CONDO UNITS SHALL HAVE BALANCING DAMPERS AT THE DIFFUSER, OPERABLE AT THE DIFFUSER FACE, TO ELIMINATE THE NEED FOR ACCESS PANELS.

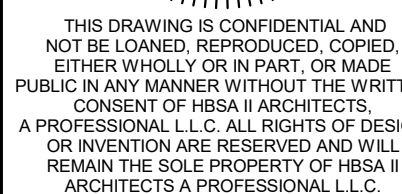
5. SECTIONS 6 AND 20 ON SHEET M1 4.3 AND CONDO 1610 ON THIS SHEET FOR GENERAL HVAC AVOIDANCE OF CONDO UNITS. ALL CONDOS SHALL HAVE EXHAUST TO THE EXTERIOR WITH OUTSIDE AIR INTAKE AT THE EXTERIOR A MINIMUM 10 FEET AWAY FROM EXHAUST. SEE HVAC SCHEDULES FOR ACTUAL HVAC UNIT SIZE AND LOCATION. EXHAUST FROM EACH UNIT SHALL BE EXHAUSTED TO THE EXTERIOR IN EACH BEDROOM, FULL BATHROOM, AND LIVING ROOM AND KITCHEN AREAS. LARGE CLOSETS AND LAUNDRY ROOMS SHALL ALSO HAVE SUPPLY AIR. MAKE ADJUSTMENTS TO AIRFLOW, DUCT SIZE, THERMOSTAT LOCATION, ETC. AS NECESSARY TO ACHIEVE THE DESIGN SYSTEMS BASED ON DIFFERENCES IN TYPICAL CONDO UNITS TO BE CONSTRUCTED.



SCALE: 3/32" = 1'-0"

HARD ROCK  
1031 CANAL STREET  
NEW ORLEANS, LOUISIANA

CERTIFIED CORRECT

16TH FLOOR - HVAC

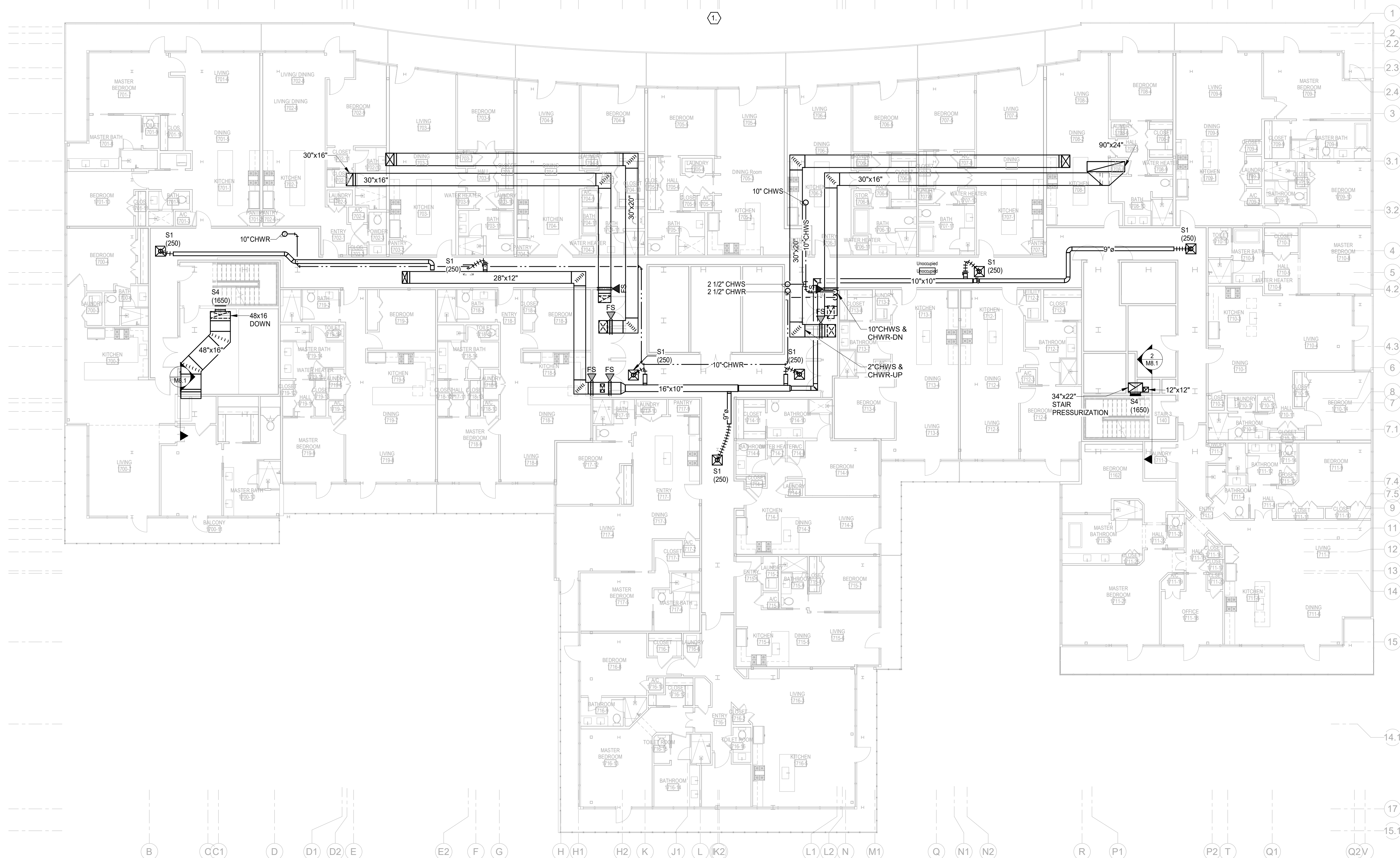
# MOSES

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New Orleans, Louisiana 70112-1034  
Tel. 504-586-1725

## M1.4.6

1031 CANAL STREET  
NEW ORLEANS, LOUISIANA

1. FOR WORK INVOLVING THE BUILDING HVAC WITHIN CONDO UNITS AND SERVING COORIDOR, SEE THE 16TH FLOOR HVAC PLAN ON SHEET M1.4.6. WORK ON THIS SHEET SHOWS HVAC RELATED TO ROUTING OF MAJOR SYSTEMS FROM THE ROOF.



SCALE: 3/32" = 1'-0"

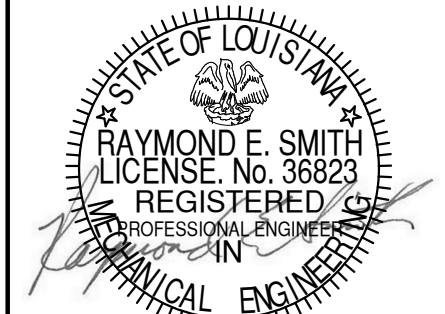
- | #  | SHEET REFERENCE NOTES  |
|----|--|
| 1. | COORDINATE WITH STRUCTURAL FOR SUPPORT OF MECHANICAL EQUIPMENT ON THE ROOF. PROVIDE SUFFICIENT SPACE FOR SERVICE AND MAINTENANCE ON THE UNITS. ALL UNITS SHALL BE A MINIMUM OF 10 FEET FROM ROOF EDGE.   |
| 2. | CONDENSING UNITS SERVING CONDOS SHALL BE LOCATED TO MINIMIZE REFRIGERANT PIPING LENGTHS. THE CURRENT LAYOUT IS A SUGGESTED LAYOUT. THE CONTRACTOR SHALL SUBMIT A LAYOUT FOR APPROVAL AND VERY THAT LINE LENGTHS WILL NOT EXCEED THE RECOMMENDED MAXIMUM. |
| 3. | CHWS AND CHWR PIPING TO AND FROM CHILLERS SHALL BE INSTALLED PER DETAIL ON M5.1.   |

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SINCE 1961

HARD ROCK  
1031 CANAL STREET  
NEW ORLEANS, LOUISIANA

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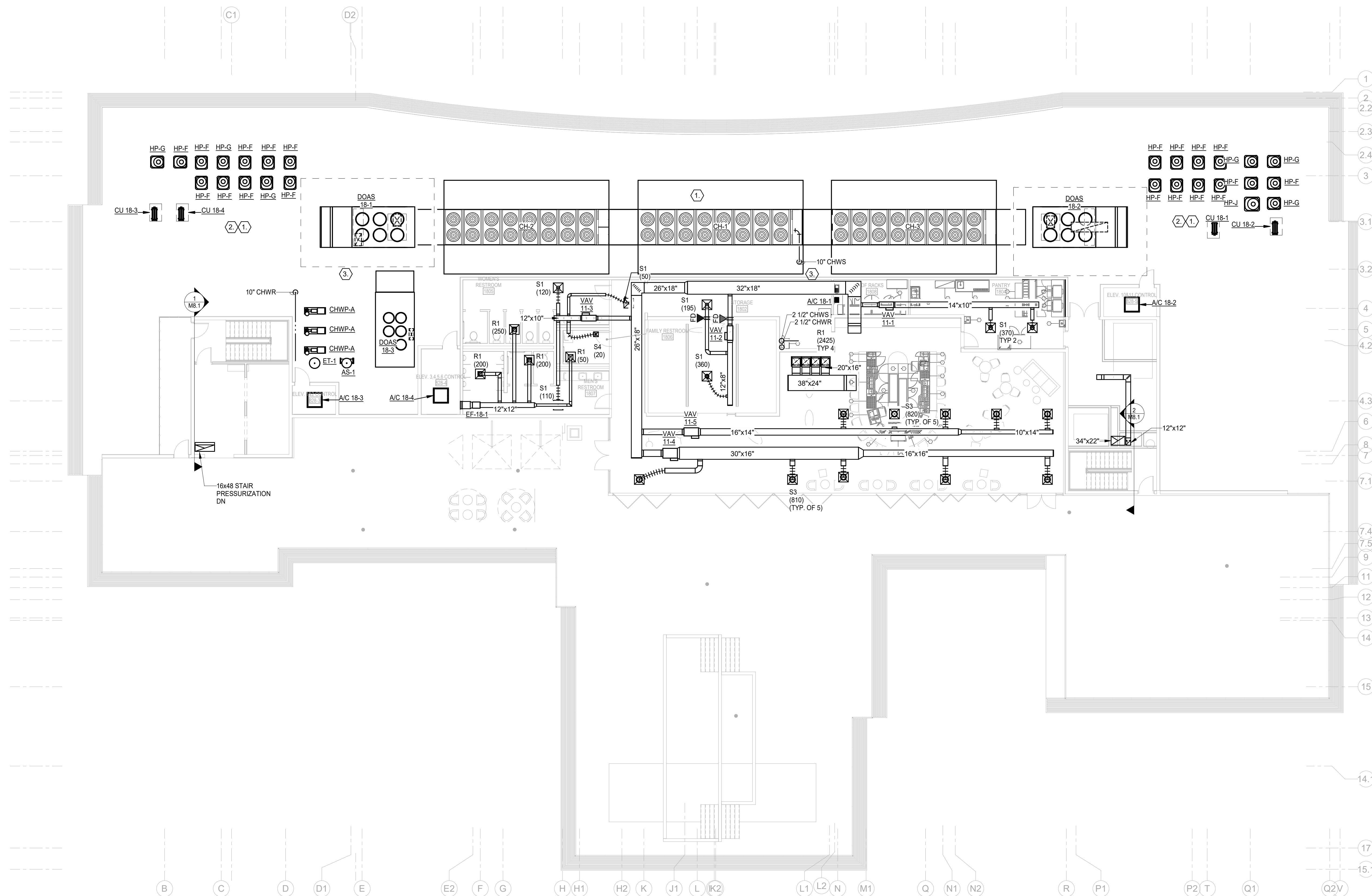
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[illegible]

18TH LEVEL - HVAC

PROJECT#: 1709  
PHASE: PERMIT  
TEAM: MEI  
CHECKER: RS  
SCALE: AS NOTED  
ISSUED: 06/05/2018

## M1.4.8



# 1 18TH FLOOR ROOF DECK

SCALE: 3/32" = 1'-0"

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ENGINEERS

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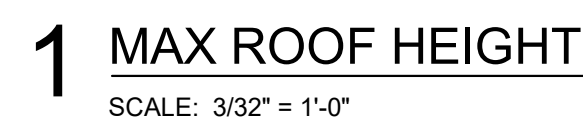
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ROOF DECK - HVAC

# M1.5



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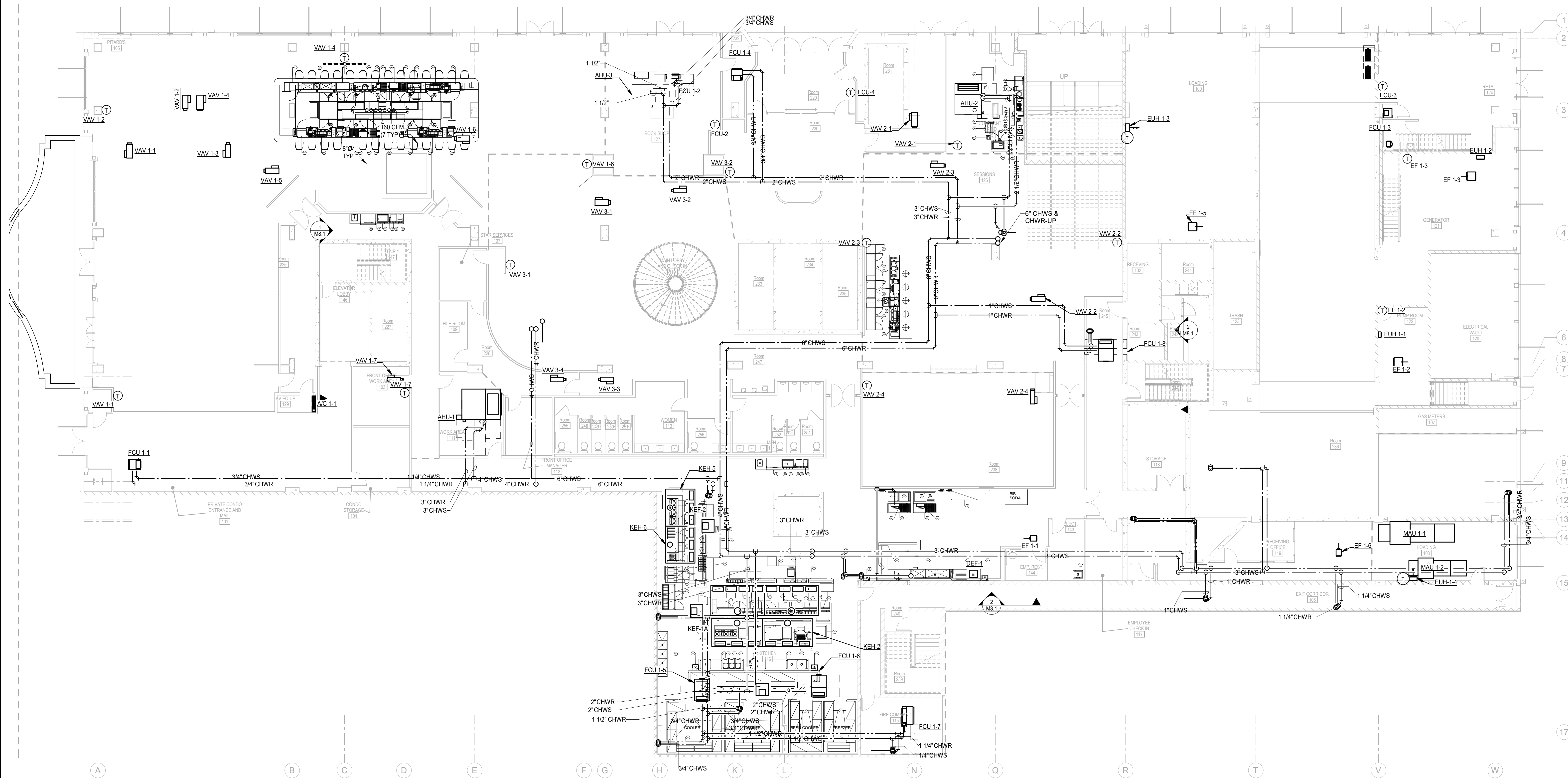
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PROJECT#: 1709  
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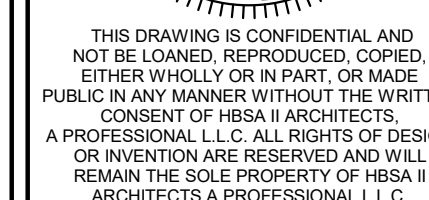
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## M2.1



SCALE: 3/32" = 1'-0"

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2ND FLOOR - PIPING

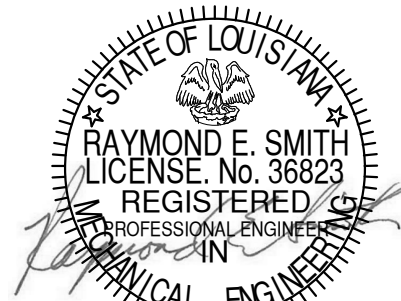
### M2.2.1



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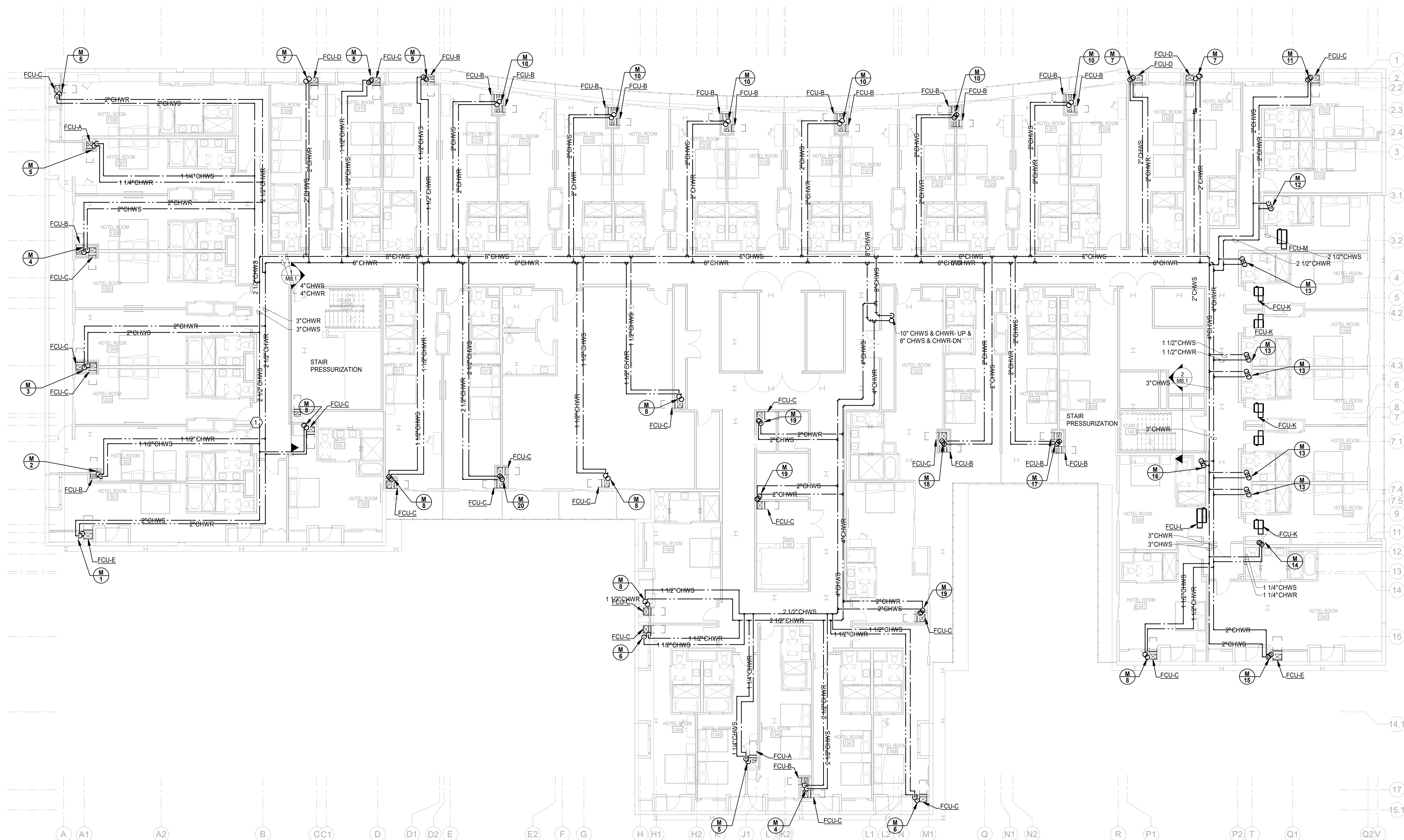
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[illegible]

13TH FLOOR - PIPING

PROJECT#: 1709  
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CHECKER: Checker  
SCALE: AS NOTED  
ISSUED: 06/05/2018

### M2.4.3



**1 13TH FLOOR HOTEL - PIPING**

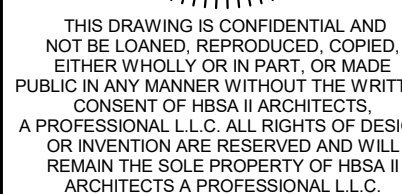
SCALE: 3/32" = 1'-0"

**MOSES**  
ENGINEERS

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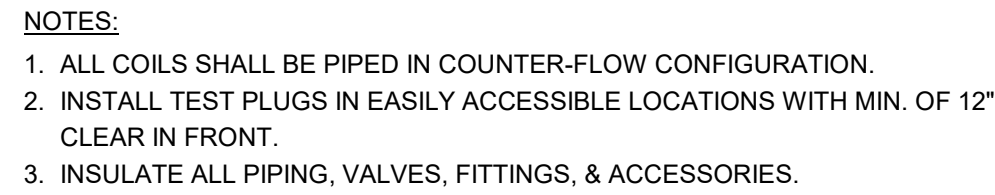
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MECHANICAL SECTIONS

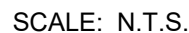
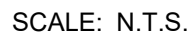
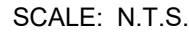
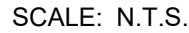
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SCALE: N.T.S.

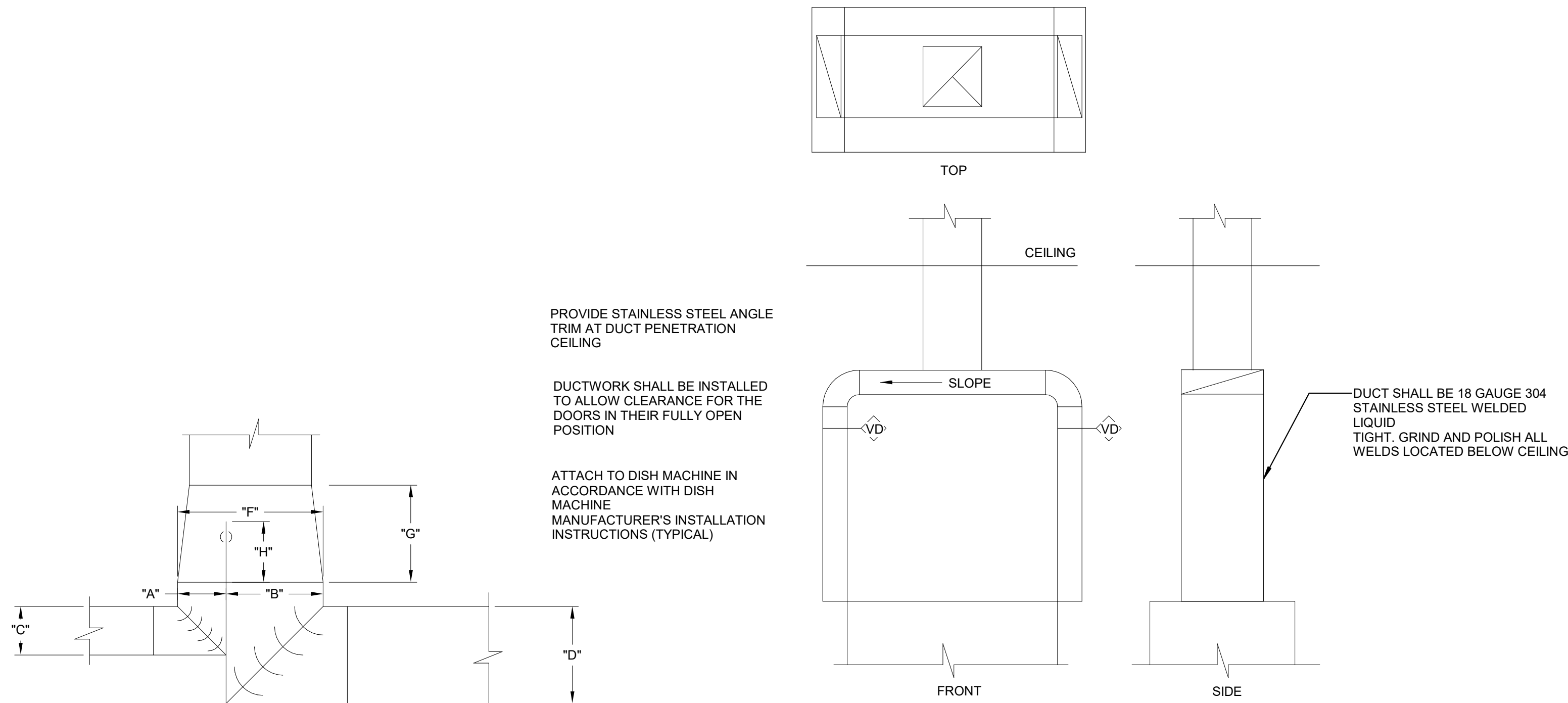


PROJECT#: 1709  
PHASE: PERMIT  
TEAM: MEI  
CHECKER: RS  
SCALE: AS NOTED  
ISSUED: 06/05/2018

REVISION HISTORY				

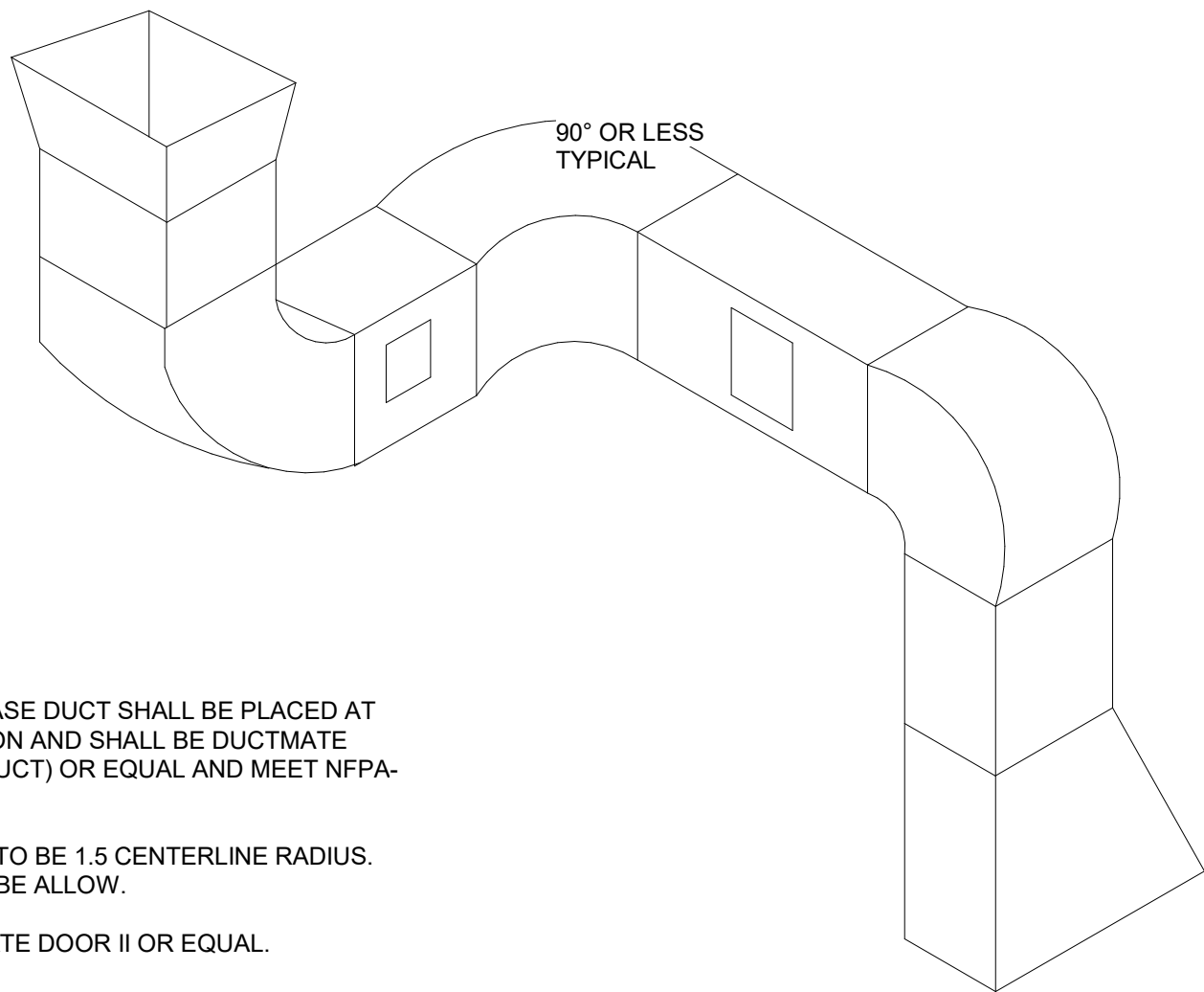
MECHANICAL DETAILS

PROJECT#: 1709  
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1 DISHWASHER EXHAUST DUCT

SCALE: N.T.S.

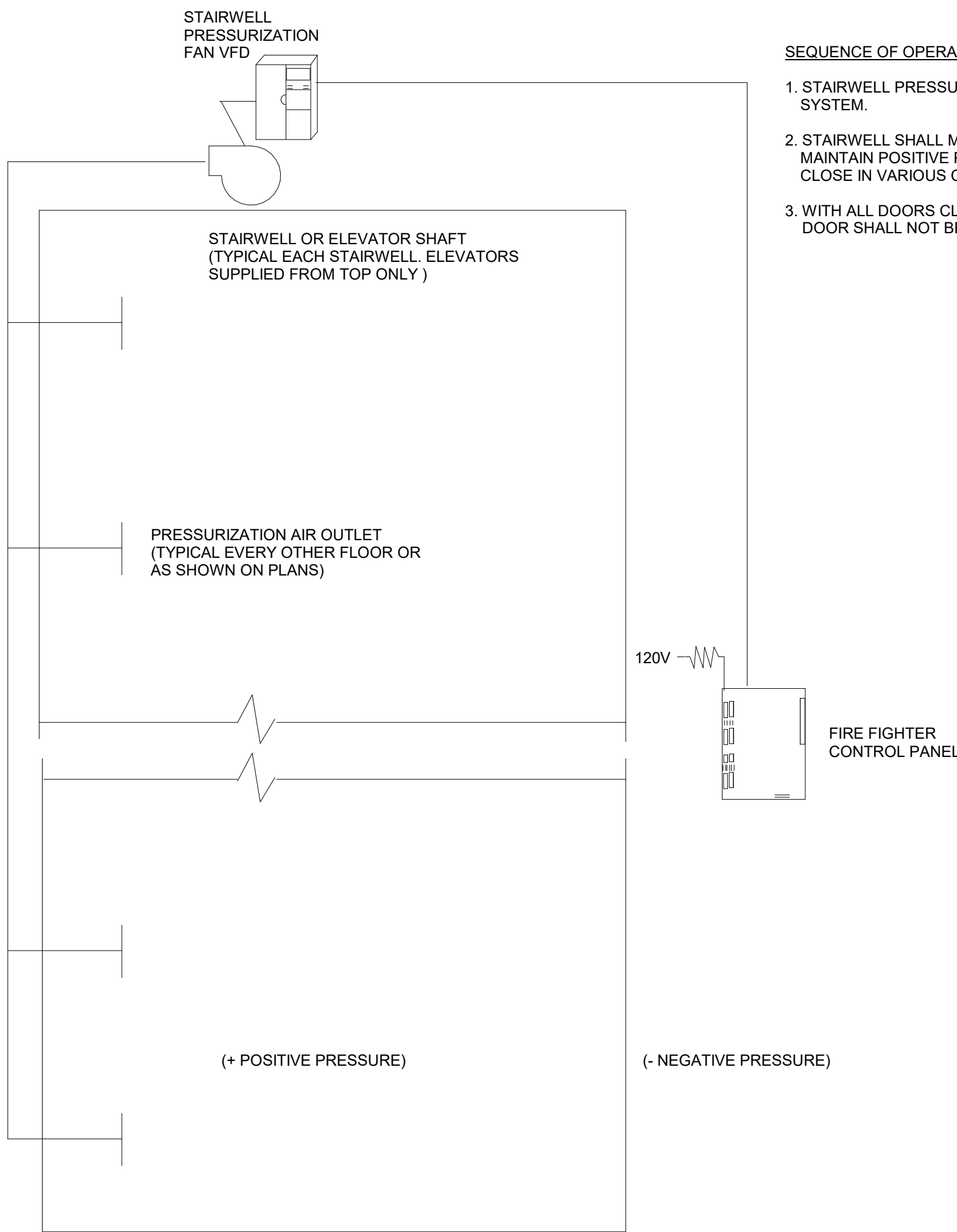


NOTES:

- ACCESS DOOR (AD) IN GREASE DUCT SHALL BE PLACED AT EVERY CHANGE IN DIRECTION AND SHALL BE DUCTMATE HIGH TEMP (FOR GREASE DUCT) OR EQUAL AND MEET NFPA-96 STANDARDS.
- ALL RADIUS ELBOW ARE TO BE 1.5 CENTERLINE RADIUS. NO MITERED ELBOWS WILL BE ALLOW.
- IS TO BE DUCTMATE ULTIMATE DOOR II OR EQUAL.
- ALL DUCT IS TO BE 16 GA. BLACK IRON WELDED LIQUID TIGHT ALL WELDS ARE TO BE TREATED AND MADE CORROSION RESISTANT
- DUCT IS TO SLOPE TOWARDS HOOD AT 1/4" PER FOOT MINIMUM.
- ALL DUCTS ARE TO SIZED FOR THE CODE REQUIRED VELOCITY OF 500 FPM MIN. TO 2500 FPM MAX.

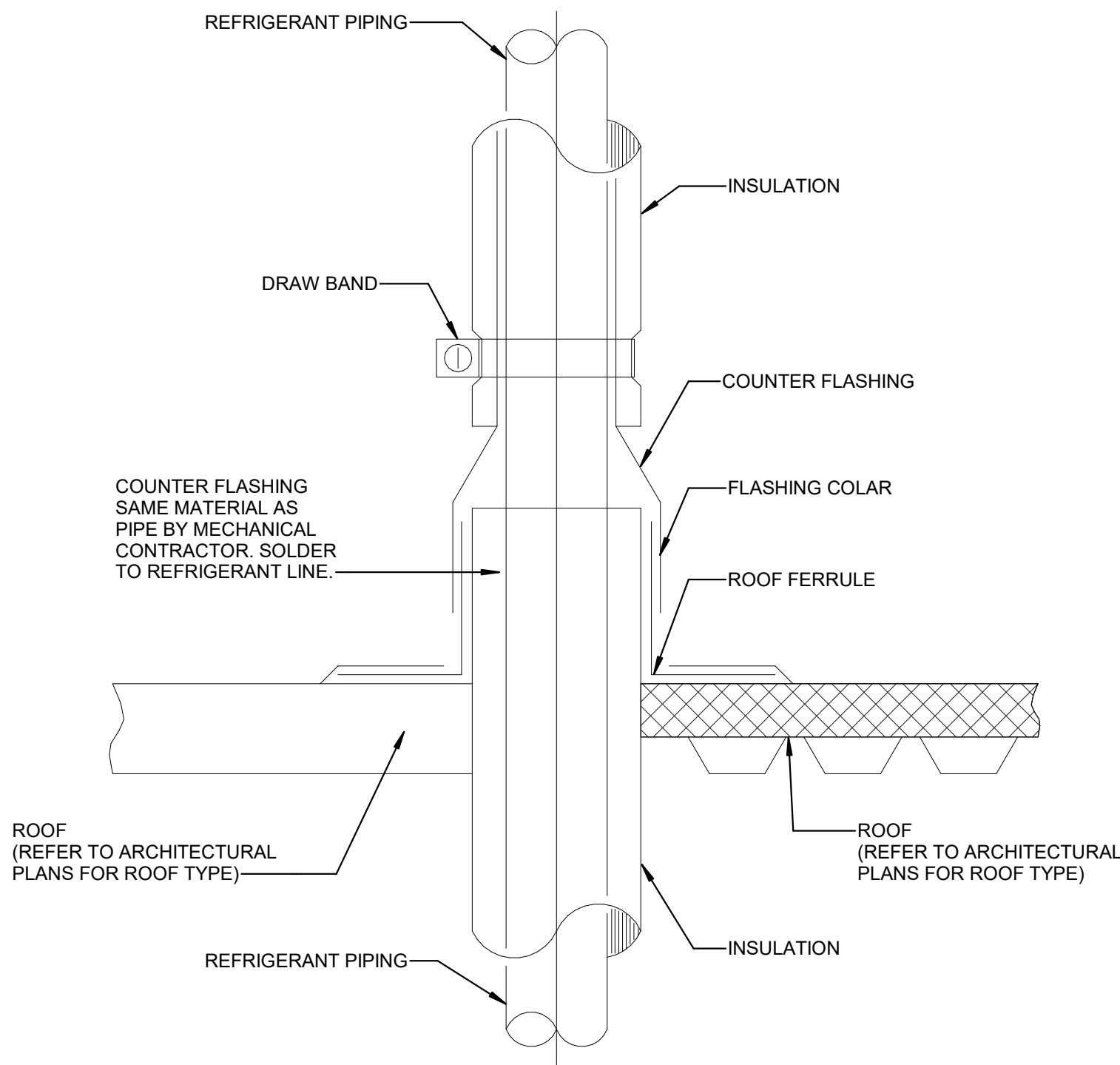
2 GREASE DUCT

SCALE: N.T.S.



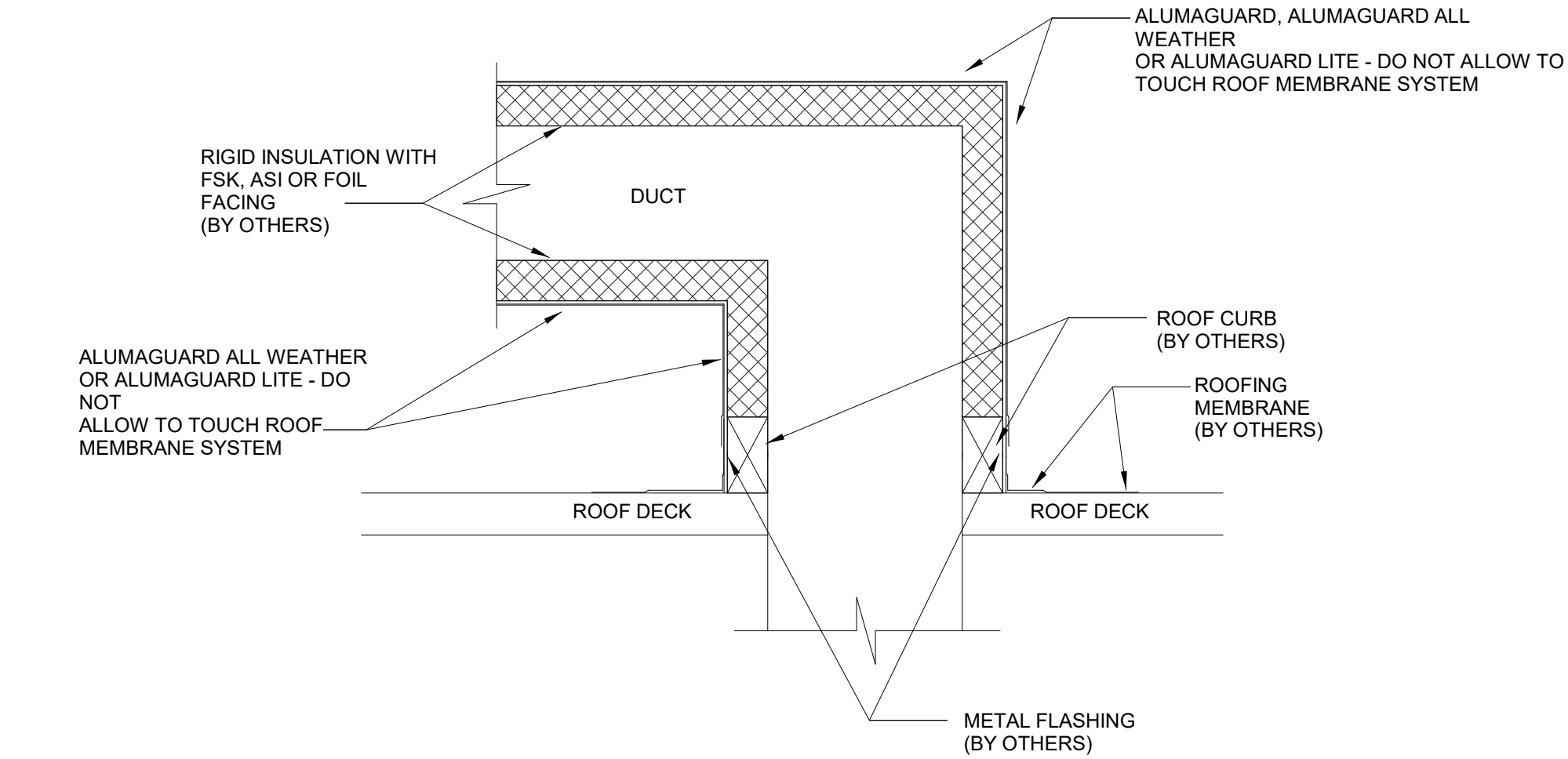
3 STAIRWELL PRESSURIZATION

SCALE: N.T.S.



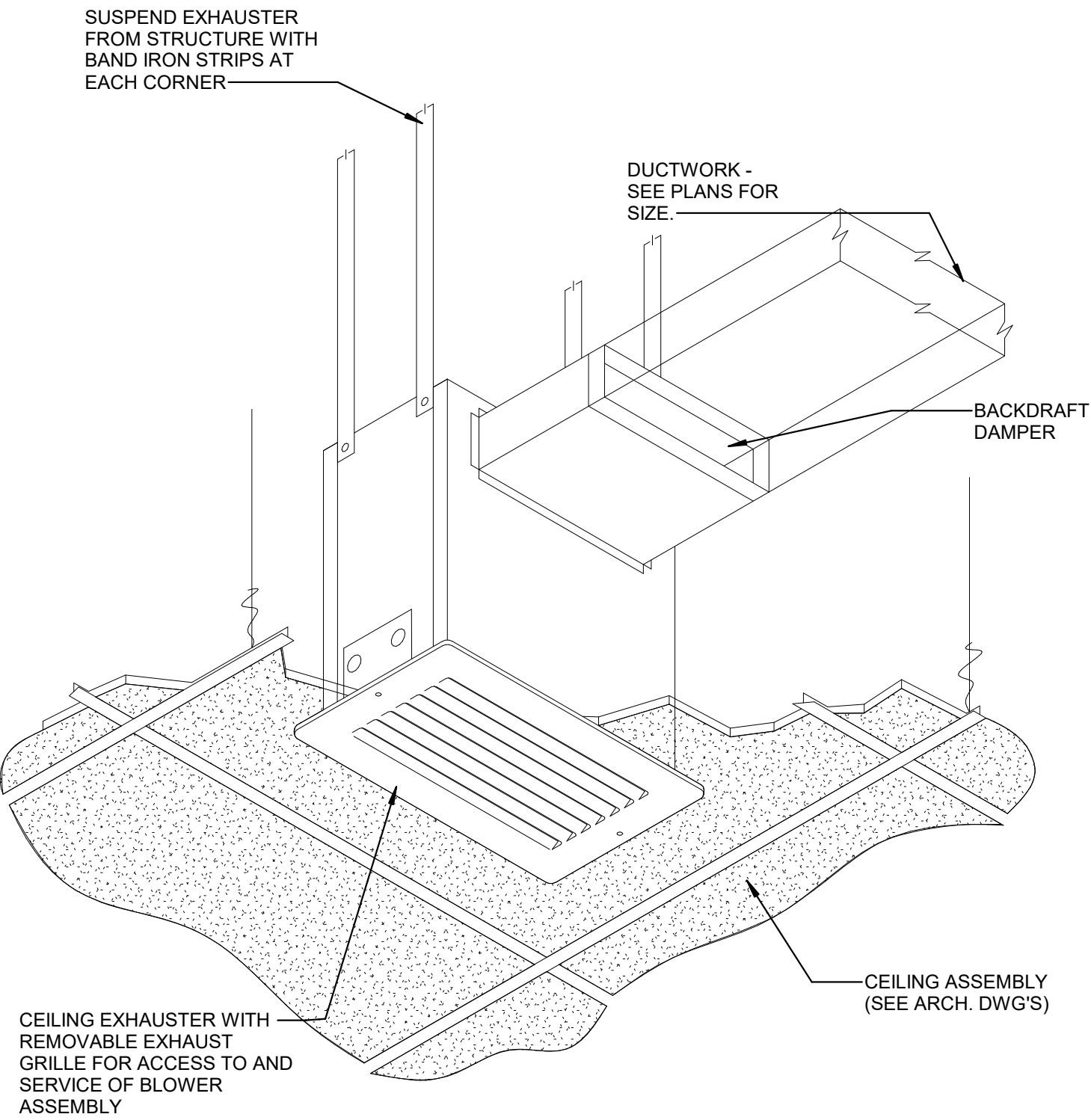
4 REFRIGERANT PIPING THRU ROOF

SCALE: N.T.S.



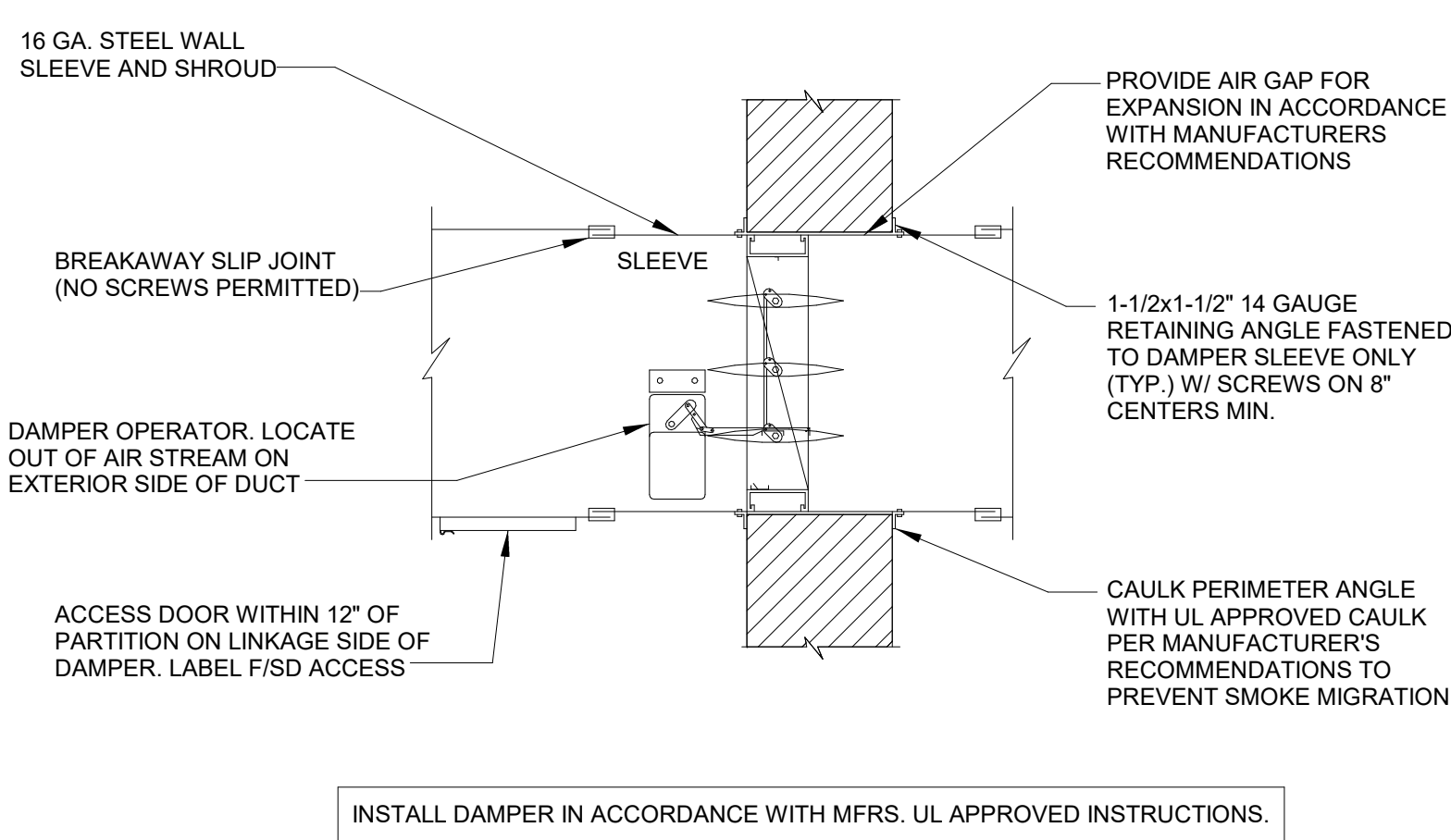
# 1 DUCT PENETRATION THROUGH ROOF

SCALE: N.T.S.



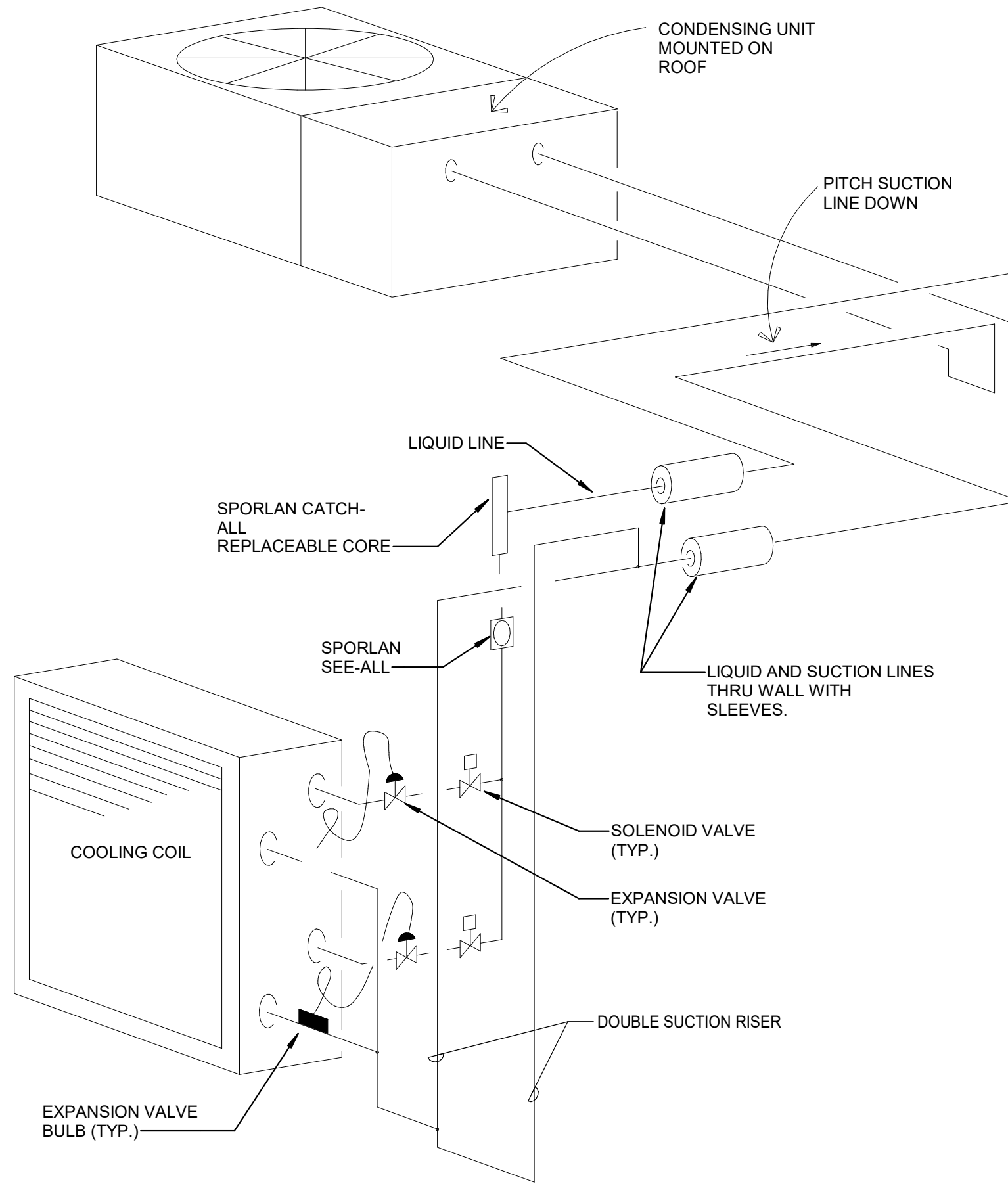
# 4 CEILING MOUNTED EXHAUST FAN

SCALE: N.T.S.



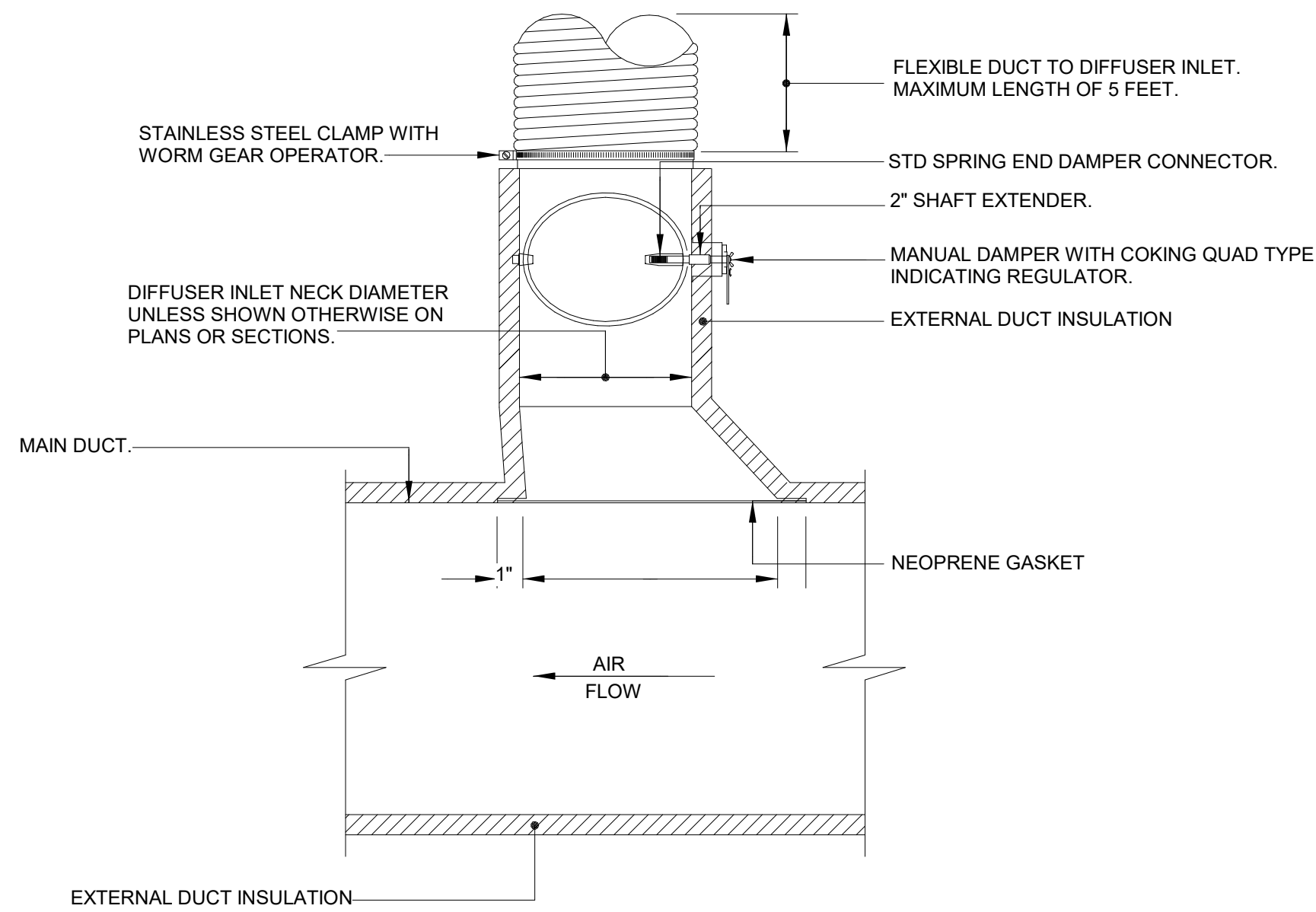
# 2 FIRE/SMOKE DAMPER

SCALE: N.T.S.



# 5 REFRIGERANT PIPING DIAGRAM

SCALE: N.T.S.



# 3 LOW PRESSURE DUCT TAKEOFF

SCALE: N.T.S.

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ISSUED: 06/05/2018



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DEDICATED OUTSIDE AIR UNITS SCHEDULE																																								
REMARKS:										ACCESSORIES:																														
1. INSTALL PER MANUFACTURER'S RECOMMENDATIONS.										1. VIBRATION ISOLATION ROOF CURB.																														
2. PROVIDE HOT GAS REHEAT TO SUPPLY NEUTRAL SUPPLY AIR.										2. BACKNET COMPATIBLE DIRECT DIGITAL CONTROLS WITH INTEGRATION .																														
3. MOUNT UNIT ON CURB HIGH ENOUGH TO ROUTE DUCT WITHIN THE CURB.										3. VARIABLE FREQUENCY DRIVE.																														
MARK	LOCATION	SUPPLY FAN DATA (EACH)					PREHEAT (SCR)		Dx COOLING COIL					HOT GAS REHEAT			ELECTRIC REHEAT					CONDENSER					ELECTRICAL DATA					BASIS OF DESIGN					WEIGHT (lbs)	ACCESSORIES	REMARKS	
		FAN QTY.	SUPPLY (CFM)	EXT SP (IWC)	MOTOR (HP)	CAP (KW)			TOT (MBH)	SENS (MBH)	EAT DB (°F)	EAT WB (°F)	LAT DB (°F)	LAT WB (°F)	CAPACITY (MBH)	MAX LAT (°F)	MIN OUTPUT (MBH)	EAT (°F)	LAT (°F)	MODULATION (%)		TYPE	EWT (°F)	LWT (°F)	FLOW (GPM)	WPD (FT)	REFRIGERANT	PREFILTER (MERV)	FINAL FILTER (MERV)	VOLT (V)	PH (pH)	FREQ (Hz)	FLA (A)	MCA (A)	MOCP (A)	MFG	MODEL			
DOAS 2-1	2ND FLR	1	1335	0.75	1	9.5	52.4				84.5	79.9	52.4	52.4	28.3	72	SCR	55.4	52.4	70	20-100	WATER COOLED	42	56			R-410A	8	11	480	3	60	98.0	117.3	125	ABOVEAIR	AWC-2400-4-HG00-00-0A-SF-D1-D	1550	2	1, 2
DOAS 2.5-1	2ND FLOOR	1	2760	0.75	1	20	52.4				84.5	79.9	52.4	52.4	57.8	72	SCR	52.5	52.4	70	20-100	WATER COOLED	42	56			R-410A	8	11	480	3	60		117.3	125	ABOVEAIR	HK	1550	2	1, 2
DOAS 4-1	4TH FLOOR	1	1645	0.75	1	12	52.4				84.5	79.9	52.4	52.4	34.5	72	SCR	51.3	52.4	70	20-100	WATER COOLED	42	56			R-410A	8	11	480	3	60		117.3	125	ABOVEAIR	HK	1550	2	1, 2

AIR HANDLING UNITS SCHEDULE	
<b>REMARKS:</b> 1. PROVIDE A SINGLE POINT ELECTRICAL CONNECTION. PROVIDE UNIT WITH INVERTER DUTY HIGH EFFICIENCY MOTOR. 2. DAMPERS, ACTUATORS, AND ACCESSORIES SHALL BE FACTORY INSTALLED AND WIRED. 3. COIL SELECTION BASED ON 8876 CFM AIRFLOW. 4. MAXIMUM FACE VELOCITY FOR COOLING COIL SHALL BE 500 FPM. 5. COIL SELECTION BASED ON 7745 CFM AIRFLOW. 6. COIL SELECTION BASED ON 3800 CFM AIRFLOW. 7. COIL SELECTION BASED ON 2755 CFM AIRFLOW. 8. COIL SELECTION BASED ON 21700 CFM AIRFLOW. 9. COIL SELECTION BASED ON 24640 CFM AIRFLOW.	<b>ACCESSORIES:</b> 1. VARIABLE FREQUENCY DRIVE WITH LINE REACTOR AND DISCONNECT. 2. HAND-OFF-AUTO SWITCH WITH 120 VOLT CONTROL TRANSFORMER AND PILOT LIGHT. 3. MODULATING GAS VALVE. 4. PROVIDE ELECTRIC HEAT AS A DUCT HEATER POWERED SEPARATE FROM THE UNIT.

AIR COOLED CHILLER SCHEDULE																									
REMARKS:												ACCESSORIES:													
1. PROVIDE VARIABLE SPEED COMPRESSOR(S) WITH VARIABLE SPEED/FREQUENCY DRIVES.												1. FACTORY INSTALLED FLOW SWITCH.													
2. PROVIDE MFG STANDARD SOUND CONTROL OPTION.												2. EVAPORATOR HEATER POWERED BY SEPARATE 115V, 15A POWER SOURCE.													
NOM CAP (TON)		REFRIGERANT		# OF PASSES	EVAPORATOR PERFORMANCE				AMBIENT		EFFICIENCY				ELECTRICAL										
MARK	(TON)				EWI (°F)	LWT (°F)	DESIGN FLOW (GPM)	MIN FLOW (GPM)	WPD (°F)	WPD (°F)	EAT (°F)	COP	EER	IPLV	NPLV	VOLT (V)	PH (PH)	FREQ (HZ)	MCA (A)	MOCP (A)	WEIGHT (lbs)	MFG	MODEL	ACCESSORIES	REMARKS
CH-1	350	R-134A	2	56	42	686.66	418.8	16.7	95	3	9.5	17.18	14.5	460	3	60	686.6	1000	20672	CARRIER	30XV350	1, 2	1, 2		
CH-2	350	R-134A	2	56	42	686.66	418.8	16.7	95	3	9.5	14.835	14.5	460	3	60	686.6	1000	20672	CARRIER	30XV350	1, 2	1, 2		
CH-3	350	R-134A	2	56	42	686.66	418.8	16.7	95	3	9.5	14.835	14.5	460	3	60	686.6	1000	20672	CARRIER	30XV350	1, 2	1, 2		

## HVAC FANS SCHEDULE

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**REMARKS:**

1. PROVIDE EQUIP ROOF BASE/CURB AS REQUIRED FOR ROOF MOUNTED FAN. FAN BASE/CURB AND FAN ATTACHMENTS SHALL WITHSTAND WIND LOADING AS INDICATED ON STRUCTURAL DRAWINGS AND SPECIFICATIONS.
2. DISCONNECT TO BE PROVIDED BY UNIT MANUFACTURER.
3. PROVIDE VARIABLE FREQUENCY DRIVE.
4. UNIT SHALL BE SEALED FOR OUTDOOR USE. PROVIDE INSECT SCREEN AND INCLUDE DRAIN CONNECTION.
5. PROVIDE SOLID STATE SPEED CONTROLLER
6. FAN SHALL BE UL LISTED FOR SMOKE CONTROL OPERATION.
7. PROVIDE LINE VOLTAGE THERMOSTAT.
8. INTERLOCK FAN WITH CONDENSING UNIT. PROVIDE FILTER ON FAN INTAKE.

MAKEUP AIR UNIT SCHEDULE																								
<div>REMARKS:</div> <div>1. PROVIDE SINGLE POINT ELECTRICAL CONNECTION.</div> <div>2. INTERLOCK WITH KEF-1A AND KEF-1B.</div> <div>3. INTERLOCK WITH KEF-2.</div> <div>4. INTERLOCK WITH KEF-3.</div>										<div>ACCESSORIES:</div> <div>1. BACNET COMPATABLE CONTROLS CAPABLE OF INTERFACE WITH KITCHEN HOOD.</div> <div>2. VARIABLE FREQUENCY DRIVE.</div> <div>3. MOTORIZED BACKDRAFT DAMPER.</div> <div>4. MODULATING GAS VALVE</div>														
MARK	LOCATION	AREA SERVED	TYPE	AIRFLOW DATA	COOLING DATA				NAT GAS HEAT				ELECTRICAL DATA				BASIS OF DESIGN		WEIGHT	ACCESSORIES	REMARKS			
				SUPPLY AIR (CFM)	EXT SP (IWC)	TOT CAP (MBH)	SENS CAP (MBH)	EAT DB (°F)	EAT WB (°F)	LAT DB (°F)	LAT WB (°F)	MIN OUTPUT	ENT TEMP	MODULATION %	FILTER (MERV)	MOTOR VOLT. (HP)	PH. (V)	FREQ. (Hz)	MFG	MODEL	(lbs)			
MAU 1-1	1ST FLR MEZZ	1ST FLR KITCHEN - CENTER	INDOOR CHW DIRECT-GAS FIRED	8538	0.85	384	126	83.6	80.4	70	70	277	30	25-100	8	7.5	460	3	60	CAPTIVEAIRE	A4-D-1000	2497	1, 2, 3, 4.	1, 2
MAU 1-2	1ST FLR MEZZ	1ST FLR KITCHEN - WEST	INDOOR CHW DIRECT-GAS FIRED	5060	0.85	228	75	83.6	80.4	70	70	164	30	25-100	8	5	460	3	60	CAPTIVEAIRE	A3-D-500	1673	1, 2, 3, 4.	1, 3.
MAU 2-1	2ND FLR MEZZ	FOOD PREP	INDOOR CHW DIRECT-GAS FIRED	7000	0.85	315	103	83.6	80.4	70	70	227	30	25-100	8	7.5	460	3	60	CAPTIVEAIRE	A3-D750	1744	1, 2, 3, 4.	1, 4.

## FAN COIL UNIT SCHEDULE

- REMARKS:
1. SINGLE POINT ELECTRICAL CONNECTION. INTEGRAL DISCONNECT
  2. PROVIDE THERMAL OVERLOAD PROTECTION FOR ELECTRICAL HEATERS.
  3. PROVIDE BACNET THERMOSTAT COMPATIBLE WITH ENERGY MANAGEMENT SYSTEM.
  4. SELECT UNIT FOR MEDIUM FAN SPEED AT DESIGN AIRFLOW.
  5. PROVIDE STAND-ALONE CONTROLS WITH 24VAC T-STAT TO BE FURNISHED AND INSTALLED BY MECHANICAL CONTRACTOR.
  6. SCHEDULED ESP DOES NOT INCLUDE CABINET LOSSES, DIRTY FILTER, ELECTRIC HEAT STRIP, COOLING COIL, AND RETURN AIR GRILLE.

- ACCESSORIES:
1. 3 SPEED PSC FAN MOTOR.
  2. FUSED SERVICE SWITCH.
  3. DRAIN PAN FLOAT SWITCH.
  4. BUILT-IN CONDENSATE PUMP.
  5. 2-WAY NC VALVE WITH 24V ACTUATOR.
  6. 24VAC WALL THERMOSTAT.

MARK	LOCATION	AREA SERVED	TYPE	FAN DATA					COOLING COIL DATA										ELECTRIC HEATING DATA				BASIS OF DESIGN			ELECTRICAL DATA		REMARKS
				SUPPLY (CFM)	OA (CFM)	EXT SP (IWC)	MOTOR (HP)	(FAN) QTY.	TOT CAP (MBH)	SENS CAP (MBH)	EAT DB (°F)	EAT WB (°F)	LAT DB (°F)	LAT WB (°F)	FLOW (GPM)	MAX PD (FT)	CAP (KW)	LAT (°F)	WEIGHT (lbs)	MFG	MODEL	VOLT (V)				PH (ø)	FREQ (Hz)	
FCU 1-1	1ST FLOOR	BOH	HORIZONTAL	900	245	0.15	0.5	1	28.8	19.6	81.5	67.7	55	53.9	4.1	4	7	85	200	CARRIER	BCHD	277	1	60	1, 2, 3, 4.	1, 2, 3, 4, 5, 6.		
FCU 1-2	1ST FLOOR	ROCK SHOP	HORIZONTAL	930	190	0.15	0.5	1	32.1	21.8	77.8	66.5	55.9	54.9	4.6	4	5	85	285	CARRIER	BCHD	277	1	60	1, 2, 3, 4.	1, 2, 3, 4, 5, 6.		
FCU 1-4	1ST FLOOR	ENTRY LOBBY	HORIZONTAL	700	70	0.15	0.5	1	21.2	16.3	77.7	65.1	55.8	54.7	3	4	3	85	200	CARRIER	BCHD	277	1	60	1, 2, 3, 4.	1, 2, 3, 4, 5, 6.		
FCU 1-5	1ST FLOOR	KITCHEN	HORIZONTAL	6660	810	0.15	1	1	200.8	155.9	80.6	67.3	58.9	57.7	28.7	4	15	85	285	CARRIER	BCHD	277	1	60	1, 2, 3, 4.	1, 2, 3, 4, 5, 6.		
FCU 1-6	1ST FLOOR	KITCHEN	HORIZONTAL	6660	810	0.15	1	1	199.2	154.3	80.5	67.3	58.9	57.7	28.5	4	14	85	285	CARRIER	BCHD	277	1	60	1, 2, 3, 4.	1, 2, 3, 4, 5, 6.		
FCU 1-7	1ST FLOOR	FIRE CONTROL	HORIZONTAL	550	70	0.15	1	1	14.3	11.6	78.2	66.1	58.8	57.7	2.1	4	7	85	285	CARRIER	BCHD	277	1	60	1, 2, 3, 4.	1, 2, 3, 4, 5, 6.		
FCU 1-8	1ST FLOOR	BOH	HORIZONTAL	1260	170	0.15	0.5	1	38.5	32	83.4	68.2	59.9	58.5	5.5	4	2	85	285	CARRIER	BCHD	277	1	60	1, 2, 3, 4.	1, 2, 3, 4, 5, 6.		
FCU 2-1	2ND FLOOR	MEETING RM 203	HORIZONTAL	1750	300	0.15	0.5	1	64.5	42.2	76.9	66.1	54.5	53.6	9.2	4	12	85	200	CARRIER	BCHD	480	3	60	1, 2, 3, 4.	1, 2, 3, 4, 5, 6.		
FCU 2-2	2ND FLOOR	MEETING RM 204	HORIZONTAL	1750	300	0.15	0.5	1	66.5	43.4	76.2	65.5	53.6	52.8	9.5	4	12	85	200	CARRIER	BCHD	480	3	60	1, 2, 3, 4.	1, 2, 3, 4, 5, 6.		
FCU 2-3	2ND FLOOR	2ND FLR CORR	HORIZONTAL	4050	250	0.3	0.5	1	83.6	72.2	71.2	61.1	54.7	53.7	12	4	19	85	200	CARRIER	BCHD	480	3	60	1, 2, 3, 4.	1, 2, 3, 4, 5, 6.		
FCU 2-4	2ND FLOOR	209	VERT. STACK	220		0.15	0.03	1	6	4.5	73.3	62	52	51	0.85	0.9	1	85	400	KRUEGER	KVPH 03	277	1	60	1, 2, 3, 4.	1, 2, 3, 4, 5, 6.		
FCU 2-5	2ND FLOOR	211	VERT. STACK	340		0.15	0.067	1	7.6	6.9	73.3	60.1	52	50.8	1.09	2.1	2	85	415	KRUEGER	KVPH 06	277	1	60	1, 2, 3, 4.	1, 2, 3, 4, 5, 6.		
FCU 2-6	2ND FLOOR	211	VERT. STACK	460		0.15	0.04	1	7.8	7.1	73	60.1	52	50.8	1.12	1.5	2	85	400	KRUEGER	KVPH 04	277	1	60	1, 2, 3, 4.	1, 2, 3, 4, 5, 6.		
FCU 2-7	2ND FLOOR	211	VERT. STACK	85		0.15	0.03	1	1.9	1.7	73.3	60.1	52	50.8	0.27	0.9	1	85	400	KRUEGER	KVPH 03	277	1	60	1, 2, 3, 4.	1, 2, 3, 4, 5, 6.		
FCU 2-8	2ND FLOOR	211	VERT. STACK	575		0.15	0.167	1	13.6	11.9	73.3	60.5	52	50.8	1.94	3	3	85	415	KRUEGER	KVPH 08	277	1	60	1, 2, 3, 4.	1, 2, 3, 4, 5, 6.		
FCU 2-9	2ND FLOOR	211	VERT. STACK	530		0.15	0.067	1	9.9	8.9	73.1	60.1	52	50.8	1.41	2.1	3	85	415	KRUEGER	KVPH 06	277	1	60	1, 2, 3, 4.	1, 2, 3, 4, 5, 6.		
FCU 2-10	2ND FLOOR	211	VERT. STACK	335		0.15	0.067	1	7.8	7	73.4	60.3	52	50.8	1.12	2.1	1	85	415	KRUEGER	KVPH 06	277	1	60	1, 2, 3, 4.	1, 2, 3, 4, 5, 6.		
FCU 2-11	2ND FLOOR	211	VERT. STACK	920		0.15	0.2	1	8.4	7.5	73.1	60.1	52	50.8	1.2	3.9	3	85	460	KRUEGER	KVPH 10	277	1	60	1, 2, 3, 4.	1, 2, 3, 4, 5, 6.		
FCU 2-12	2ND FLOOR	211	VERT. STACK	920		0.15	0.2	1	8.4	7.5	73.1	60.1	52	50.8	1.2	3.9	3	85	460	KRUEGER	KVPH 10	277	1	60	1, 2, 3, 4.	1, 2, 3, 4, 5, 6.		
FCU 2-13	2ND FLOOR	211	VERT. STACK	965		0.15	0.2	1	7.4	7.4	75.9	46.3	55	35.5	1.1	3.9	5	85	460	KRUEGER	KVPH 10	277	1	60	1, 2, 3, 4.	1, 2, 3, 4, 5, 6.		
FCU 2-14	2ND FLOOR	211	VERT. STACK	110		0.05	0.03	1	2.4	2.4	76.7	46.7	55	35.5	0.3	0.9	0	85	400	KRUEGER	KVPH 03	277	1	60	1, 2, 3, 4.	1, 2, 3, 4, 5, 6.		
FCU 2-15	2ND FLOOR	211	VERT. STACK	310		0.15	0.067	1	5.5	4.2	72.9	61.7	52	51	0.78	2.1	2	85	415	KRUEGER	KVPH 06	277	1	60	1, 2, 3, 4.	1, 2, 3, 4, 5, 6.		
FCU 2-16	2ND FLOOR	211	VERT. STACK	480		0.15	0.067	1	5.1	4.8	76	62.2	55	53.7	0.7	2.1	3	85	415	KRUEGER	KVPH 06	277	1	60	1, 2, 3, 4.	1, 2, 3, 4, 5, 6.		
FCU 2-17	2ND FLOOR	PREP KITCHEN	HORIZONTAL	1800		0.15	1	1	57.4	43.1	81.3	68.1	59.1	57.9	8.21	4	7	85	200	CARRIER	BCHD	480	3	60	1, 2, 3, 4.	1, 2, 3, 4, 5, 6.		
FCU 2-18	2ND FLOOR	PREP KITCHEN	VERTICAL	1650		0.3	1	1	56.9	40.6	82.1	68.9	59.3	58.1	8.13	4	3	85										
FCU 2-5-1	2ND FLR MEZZ	211	VERT. STACK	865		0.15	0.5	1	17.4	14.2	73.2	62.5	55	54	2.5	3.9	4	85	460	KRUEGER	KVPH 10	277	1	60	1, 2, 3, 4.	1, 2, 3, 4, 5, 6.		
FCU 2-5-2	2ND FLR MEZZ	211	VERT. STACK	1080		0.15	0.5	1	22.3	18.6	73.3	62.5	55	54	3.2	5	5	85	460	KRUEGER	KVPH 12	277	1	60	1, 2, 3, 4.	1, 2, 3, 4, 5, 6.		
FCU 2-5-3	2ND FLR MEZZ	211	VERT. STACK	900		0.15	0.5	1	12.3	8.9	72.7	63.3	55	54.2	1.8	3.9	4	85	460	KRUEGER	KVPH 10	277	1	60	1, 2, 3, 4.	1, 2, 3, 4, 5, 6.		
FCU 2-5-4	2ND FLR MEZZ	211	VERT. STACK	900		0.15	0.5	1	12.3	8.9	72.7	63.3	55	54.2	1.8	3.9	4	85	460	KRUEGER	KVPH 10	277	1	60	1, 2, 3, 4.	1, 2, 3, 4, 5, 6.		
FCU 2-5-5	2ND FLR MEZZ	211	VERT. STACK	900		0.15	0.5	1	12.3	8.9	72.7	63.3	55	54.2	1.8	3.9	4	85	460	KRUEGER	KVPH 10	277	1	60	1, 2, 3, 4.	1, 2, 3, 4, 5, 6.		
FCU 2-5-6	2ND FLR MEZZ	GYM	VERTICAL	3265		0.3	1	1	74.1	64.3	73.5	62	55	53.9	10.6	4	14	85		CARRIER		208	1	60				
FCU 2-5-7	2ND FLR MEZZ	211	VERT. STACK	610		0.15	0.5	1	12.9	10.1	78.9	65	55	53.8	1.9	5	3	85	460	KRUEGER	KVPH 12	277	1	60	1, 2, 3, 4.	1, 2, 3, 4, 5, 6.		
FCU 2-5-8	2ND FLR MEZZ	211	VERT. STACK	500		0.15	0.33	1	6.7	4.8	72.7	63.4	55	54.2	1	2.1	3	85	415	KRUEGER	KVPH 06	277	1	60	1, 2, 3, 4.	1, 2, 3, 4, 5, 6.		
FCU 2-5-9	2ND FLR MEZZ	211	VERT. STACK	920		0.15	0.5	1	16.3	12.8	73.1	62.7	55	54.1	2.3	3.9	5	85	460	KRUEGER	KVPH 10	277	1	60	1, 2, 3, 4.	1, 2, 3, 4, 5, 6.		
FCU 2-5-10	2ND FLR MEZZ	211	VERT. STACK	805		0.15	0.5	1	11	8.8	72.8	62.4	55	54	1.6	3.9	4	85	460	KRUEGER	KVPH 10	277	1	60	1, 2, 3, 4.	1, 2, 3, 4, 5, 6.		
FCU 2-5-11	2ND FLR MEZZ	211	VERT. STACK	870		0.15	0.5	1	15.4	12.1	73	62.7	55	54.1	2.2	3.9	4	85	460	KRUEGER	KVPH 10	277	1	60	1, 2, 3, 4.	1, 2, 3, 4, 5, 6.		
FCU 2-5-12	2ND FLR MEZZ	211	VERT. STACK	770		0.15	0.5	1	13.5	10.6	73	62.7	55	54.1	1.9	3.9	4	85	460	KRUEGER	KVPH 10	277	1	60	1, 2, 3, 4.	1, 2, 3, 4, 5, 6.		
FCU 2-5-13	2ND FLR MEZZ	211	VERT. STACK	655		0.15	0.5	1	14.6	12.1	73.4	62.4	55	54	2.1	3	3	85	415	KRUEGER	KVPH 08	277	1	60	1, 2, 3, 4.	1, 2, 3, 4, 5, 6.		
FCU 2-5-14	2ND FLR MEZZ	211	VERT. STACK	935		0.15	0.5	1	14.7	11.2	72.9	62.9	55	54.1	2.1	5	5	85	460	KRUEGER	KVPH 12	277	1	60	1, 2, 3, 4.	1, 2, 3, 4, 5, 6.		
FCU 2-5-15	2ND FLR MEZZ	211	VERT. STACK	860		0.15	0.5	1	13.3	10.7	72.9	62.4	55	54	1.9	3.9	4	85	460	KRUEGER	KVPH 10	277	1	60	1, 2, 3, 4.	1, 2, 3, 4, 5, 6.		
FCU 2-5-16	2ND FLR MEZZ	211	VERT. STACK	865		0.15	0.5	1	14.5	11.2	73	62.8	55	54.1	2.1	3.9	4	85	460	KRUEGER	KVPH 10	277	1	60	1, 2, 3, 4.	1, 2, 3, 4, 5, 6.		
FCU 2-5-17	2ND FLR MEZZ	211	VERT. STACK	410		0.15	0.33	1	9.3	7.9	73.4	62.2	55	54	1.3	2.1	2	85	415	KRUEGER	KVPH 06	277	1	60	1, 2, 3, 4.	1, 2, 3, 4, 5, 6.		
FCU 2-5-18	2ND FLR MEZZ	211	VERT. STACK	525		0.15	0.33	1	7.6	6.1	72.9	62.4	55	54	1.1	2.1	3	85	415	KRUEGER	KVPH 06	277	1	60	1, 2, 3, 4.	1, 2, 3, 4, 5, 6.		
FCU 2-5-19	2ND FLR MEZZ	211	VERT. STACK	840		0.15	0.5	1	14.1	10.9	73	62.8	55	54.1	2	3.9	4	85	460	KRUEGER	KVPH 10	277	1	60	1, 2, 3, 4.	1, 2, 3, 4, 5, 6.		
FCU 3-1	3RD FLOOR	OSBF	VERTICAL	1270		0.15	0.5	1	29	27.8	80.2	64.9	58	56.6	4.2	5	4	85	150	TRANE	BCVD	277	1	60	1, 2, 3, 4.	1, 2, 3, 4, 5, 6.		



EXPANSION TANK SCHEDULE											
REMARKS: 1. CHARGE PRESSURE TO BE VERIFIED UPON INSTALLATION OF HVAC SYSTEM. PROVIDE SIGHT GLASS. 2. INSTALL TANK PER MANUFACRURER'S RECOMMENDATION. TANK SHALL BE ASME RATED.											
MARK	LOCATION	SYSTEM	TYPE	ACCEPT VOL (GAL)	TANK VOL (GAL)	CHARGE PRESS (PSI)	BASIS OF DESIGN		WEIGHT (lbs)	REMARKS	
							MANUFACTURER	MODEL			
ET-1	ROOF	CHILLED WATER	DIAPHRAGM	8.1	105	50	BELL AND GOSSETT	D-200V	600	1., 2.	

AIR SEPARATOR SCHEDULE										
REMARKS: 1. ROUTE DRAIN LINE TO NEAREST ROOF DRAIN. 2. INSTALL PER MFG RECOMMENDATIONS. PROVIDE BLOWDOWN VALVE, AUTOMATIC AIR VENT, AND SKIM VALVE ACCESSORIES.										
MARK	LOCATION	SYSTEM	TYPE	FLOW RATE (GPM)	PIPE CONNECTION	MAX ΔP	BASIS OF DESIGN		WEIGHT (lbs)	REMARKS
							MANUFACTURER	MODEL		
AS-1	ROOF	CHILLED WATER	COALESCING	2070.00	12"	0.50 psi	BELL AND GOSSETT	CRS-12F	2810	1., 2.

LINEAR DIFFUSERS AND GRILLES SCHEDULE																	
REMARKS: 1. PROVIDE ACCESS PANEL AT MANUAL VOLUME DAMPER FOR DIFFUSERS MOUNTED IN GYPSUM BOARD CEILINGS WHERE BRANCH DUCT SERVING THE DIFFUSER IS ALSO ABOVE INACCESSIBLE CEILING. 2. COORDINATE DIFFUSER LOCATION WITH ARCHITECTURAL REFLECTED CEILING PLANS AND WALL ELEVATIONS. COORDINATE COLOR SELECTION WITH ARCHITECT AND SUBMIT FOR APPROVAL. 3. FURNISH AND INSTALL BRANCH DUCT TO MATCH NECK SIZE UNLESS OTHERWISE NOTED ON PLANS. 4. BORDER TYPE TO MATCH CEILING/WALL CONSTRUCTION. COORDINATE WITH ARCHITECTURAL CEILING/WALL PLAN. 5. 6.												ACCESSORIES: 1. OPPOSED BLADE DAMPER (UNLESS IN BRANCH DUCT). 2. ENGINEERED SLOT PLENUM 3. 4. 5. 6. 7. 8.					
MARK	SERVICE	LOCATION	TYPE	AIRFLOW RANGE		NECK SIZE (INCH)			DIFFUSER SIZE (INCH)		# OF SLOTS/BAR S	SLOT/BAR SPACING (INCH)	MAX .NC	BASIS OF DESIGN		ACCESSORIES	REMARKS
				MIN. (CFM)	MAX. (CFM)	DIA. (ø)	L	W	LENGTH (INCH)	WIDTH				MFG.	MODEL		
L1	SUPPLY	CEILING	LINEAR SLOT	0	60	5	-	-	12	-	2	1	30	PRICE	SDS100	1.	1, 2, 3, 4.
L1	SUPPLY	CEILING	LINEAR SLOT	61	120	6	-	-	24	-	2	1	30	PRICE	SDS100	1, 2.	1, 2, 3, 4.
L1	SUPPLY	CEILING	LINEAR SLOT	121	180	6	-	-	36	-	2	1	30	PRICE	SDS100	1, 2.	1, 2, 3, 4.
L1	SUPPLY	CEILING	LINEAR SLOT	181	240	7	-	-	48	-	2	1	30	PRICE	SDS100	1, 2.	1, 2, 3, 4.
L1	SUPPLY	CEILING	LINEAR SLOT	241	300	8	-	-	60	-	2	1	30	PRICE	SDS100	1, 2.	1, 2, 3, 4.
L2	SUPPLY	SIDEWALL	LINEAR BAR GRILLE	0	75	-	4	6	4	6	10	1/2	30	PRICE	LBP 16B	1.	1, 2, 3, 4.
L2	SUPPLY	SIDEWALL	LINEAR BAR GRILLE	76	110	-	6	6	6	6	10	1/2	30	PRICE	LBP 16B	1.	1, 2, 3, 4.
L2	SUPPLY	SIDEWALL	LINEAR BAR GRILLE	111	180	-	10	6	10	6	10	1/2	30	PRICE	LBP 16B	1.	1, 2, 3, 4.
L2	SUPPLY	SIDEWALL	LINEAR BAR GRILLE	181	290	-	16	6	16	6	10	1/2	30	PRICE	LBP 16B	1.	1, 2, 3, 4.
L2	SUPPLY	SIDEWALL	LINEAR BAR GRILLE	291	505	-	28	6	28	6	10	1/2	30	PRICE	LBP 16B	1.	1, 2, 3, 4.
L3	RETURN/EXHAUST	CEILING	LINEAR SLOT	0	90	6	-	-	12	-	2	1	30	PRICE	SDR100		2, 3, 4.
L3	RETURN/EXHAUST	CEILING	LINEAR SLOT	91	180	8	-	-	24	-	2	1	30	PRICE	SDR100	2.	2, 3, 4.
L3	RETURN/EXHAUST	CEILING	LINEAR SLOT	181	270	9	-	-	36	-	2	1	30	PRICE	SDR100	2.	2, 3, 4.
L3	RETURN/EXHAUST	CEILING	LINEAR SLOT	271	360	10	-	-	48	-	2	1	30	PRICE	SDR100	2.	2, 3, 4.
L3	RETURN/EXHAUST	CEILING	LINEAR SLOT	361	450	12	-	-	60	-	2	1	30	PRICE	SDR100	2.	2, 3, 4.
L4	RETURN/EXHAUST	SIDEWALL	LINEAR BAR GRILLE	0	75	-	4	6	4	6	10	1/2	30	PRICE	LBP 15B		2, 3, 4.
L4	RETURN/EXHAUST	SIDEWALL	LINEAR BAR GRILLE	76	110	-	6	6	6	6	10	1/2	30	PRICE	LBP 15B		2, 3, 4.
L4	RETURN/EXHAUST	SIDEWALL	LINEAR BAR GRILLE	111	180	-	10	6	10	6	10	1/2	30	PRICE	LBP 15B		2, 3, 4.
L4	RETURN/EXHAUST	SIDEWALL	LINEAR BAR GRILLE	181	290	-	16	6	16	6	10	1/2	30	PRICE	LBP 15B		2, 3, 4.
L4	RETURN/EXHAUST	SIDEWALL	LINEAR BAR GRILLE	291	505	-	28	6	28	6	10	1/2	30	PRICE	LBP 15B		2, 3, 4.
L5	SUPPLY	CEILING	LINEAR SLOT	720	960	12	-	-	72	-	5	1	30	PRICE	SDS100	1, 2.	1, 2, 3, 4.
L6	SUPPLY	CEILING	LINEAR SLOT	420	719	12	-	-	72	-	3	1	30	PRICE	SDS100	1, 2.	1, 2, 3, 4.
S3	SUPPLY	CEILING	CURVED VANE	0	75	-	6	4	L+1-3/4	W+1-3/4	-	-	30	PRICE	CVD	1.	1, 2, 3, 4, 5, 6.
S3	SUPPLY	CEILING	CURVED VANE	76	140	-	6	6	L+1-3/4	W+1-3/4	-	-	30	PRICE	CVD	1.	1, 2, 3, 4, 5, 6.
S3	SUPPLY	CEILING	CURVED VANE	141	225	-	10	8	L+1-3/4	W+1-3/4	-	-	30	PRICE	CVD	1.	1, 2, 3, 4, 5, 6.
S3	SUPPLY	CEILING	CURVED VANE	226	325	-	12	10	L+1-3/4	W+1-3/4	-	-	30	PRICE	CVD	1.	1, 2, 3, 4, 5, 6.
S3	SUPPLY	CEILING	CURVED VANE	326	445	-	14	12	L+1-3/4	W+1-3/4	-	-	30	PRICE	CVD	1.	1, 2, 3, 4, 5, 6.
S4	SUPPLY	SIDEWALL	LOUVERED	0	105	-	6	5	L+1-3/4	W+1-3/4	30	3/4	30	PRICE	22	1.	2, 3, 4, 6.
S4	SUPPLY	SIDEWALL	LOUVERED	106	255	-	10	6	L+1-3/4	W+1-3/4	30	3/4	30	PRICE	22	1.	2, 3, 4, 6.
S4	SUPPLY	SIDEWALL	LOUVERED	256	650	-	14	10	L+1-3/4	W+1-3/4	30	3/4	30	PRICE	22	1.	2, 3, 4, 6.
S4	SUPPLY	SIDEWALL	LOUVERED	651	1500	-	20	16	L+1-3/4	W+1-3/4	30	3/4	30	PRICE	22	1.	2, 3, 4, 6.
S4	SUPPLY	SIDEWALL	LOUVERED	1501	2980	-	30	24	L+1-3/4	W+1-3/4	30	3/4	30	PRICE	22	1.	2, 3, 4, 6.

MECHANICAL PUMPS																
REMARKS: 1. PROVIDE VARIABLE FREQUENCY DRIVE. 2. MOUNT ON VIBRATION ISOLATION PUMP BASE. 3. PUMPS SHALL BE PIPED IN REVERSE RETURN CONFIGURATION.							ACCESSORIES: 1. SUCTION DIFFUSER 2. TRIPLE DUTY VALVE 3. FLEXIBLE PIPE CONNECTIONS									
				ELECTRICAL DATA							BASIS OF DESIGN		WEIGHT (LBS)	ACCESSORIES	REMARKS	
MARK	SYSTEM	LOCATION	TYPE	FLOW (GPM)	HEAD (FT)	SYSTEM PRESSURE (PSI)	MOTOR (HP)	MOTOR (RPM)	VOLT (V)	PH (ø)	FREQ (Hz)	MANUFACTURER				MODEL
CHWP-A	CHILLED WATER	ROOF	BASE MOUNTED END-SUCTION	690	100	100	25		460	3	60	BELL AND GOSSETT	E-1510 4EB		1., 2., 3.	1., 2., 3.

ELECTRIC UNIT HEATER SCHEDULE											
REMARKS: 1. PROVIDE LINE VOLTAGE THERMOSTAT. 2. HANG UNIT ON BRACKET. COMPLY WITH MFG. CLEARANCE...							ACCESSORIES: 1. OSHA FAN GUARD. 2. LOUVER DIFFUSER. 3. WALL MOUNTED ROOM THERMOSTAT. 4. WALL MOUNTED DISCONNECT SWITCH. 5. SURFACE MOUNTING KIT.				
MARK	CAPACITY (kW)	NO. OF STAGES	LAT (°F)	VOLTAGE (V)	PHASE (ø)	FREQUENCY (Hz)	BASIS OF DESIGN		WEIGHT (LBS)	ACCESSORIES	REMARKS
							MANUFACTURER	MODEL			
EUH-1-1	2	1	85	208	1	60	TRANE	UHWA	41	4., 5.	1.
EUH-1-2	2	1	85	208	1	60	TRANE	UHWA	41	4., 5.	1.
EUH-1-3	2	1	85	208	1	60	TRANE	UHWA	41	4., 5.	1.
EUH-1-4	2	1	85	208	1	60	TRANE	UHWA	41	4., 5.	1.

DIFFUSER, REGISTERS, AND GRILLES SCHEDULE																	
REMARKS:												ACCESSORIES:					
1. PROVIDE ACCESS PANEL AT MANUAL VOLUME DAMPER FOR DIFFUSERS MOUNTED IN GYPSUM BOARD CEILINGS WHERE BRANCH DUCT SERVING THE DIFFUSER IS ALSO ABOVE INACCESSIBLE CEILING.												1. OPPOSED BLADE DAMPER (UNLESS IN BRANCH DUCT).					
2. ALL DIFFUSERS IN THE SAME ROOM OR SPACE SHALL HAVE THE SAME FACE/MODULE SIZE USING THE LARGEST SIZE OF THE SCHEDULED DIFFUSERS IN THAT SPACE.												2. EQUALIZING GRID.					
3. FURNISH AND INSTALL BRANCH DUCT TO MATCH NECK SIZE UNLESS OTHERWISE NOTED ON PLANS.												3. SECTORIZING BAFFLE (LESS THAN 4-WAY BLOW).					
4. FRAME TYPE TO MATCH CEILING/WALL CONSTRUCTION. COORDINATE WITH ARCHITECTURAL CEILING/WALL PLAN.												4. ROUND NECK ADAPTOR.					
5. 4-WAY THROW PATTERN UNLESS OTHERWISE NOTED ON PLANS.												5. 24"x24" MOUNTING FRAME.					
6. COORDINATE DIFFUSER LOCATION WITH ARCHITECTURAL REFLECTED CEILING PLANS AND WALL ELEVATIONS.												6. 12"x12" MOUNTING FRAME.					
												7.					
												8.					
MARK	SERVICE	LOCATION	TYPE	AIRFLOW RANGE		NECK SIZE (INCH)		FACE SIZE (INCH)		DEFLECTION (°)	BLADE SPACING (INCH)	MAX .NC	BASIS OF DESIGN		ACCESSORIES	REMARKS	
				MIN (CFM)	MAX (CFM)	DIA. (ø)	L	W	LENGTH				WIDTH	MFG.			MODEL
S1	SUPPLY	CEILING	PLAQUE	0	95	6	-	-	24	24	-	-	30	PRICE	ASPD	3	1., 3., 4., 5., 6.
S1	SUPPLY	CEILING	PLAQUE	96	205	8	-	-	24	24	-	-	30	PRICE	ASPD	3	1., 3., 4., 5., 6.
S1	SUPPLY	CEILING	PLAQUE	206	375	10	-	-	24	24	-	-	30	PRICE	ASPD	3	1., 3., 4., 5., 6.
S1	SUPPLY	CEILING	PLAQUE	376	605	12	-	-	24	24	-	-	30	PRICE	ASPD	3	1., 3., 4., 5., 6.
S1	SUPPLY	CEILING	PLAQUE	606	855	14	-	-	24	24	-	-	30	PRICE	ASPD	3	1., 3., 4., 5., 6.
S1	SUPPLY	CEILING	PLAQUE	851	980	15	-	-	24	24	-	-	30	PRICE	ASPD	3	1., 3., 4., 5., 6.
S2	SUPPLY	CEILING	PLAQUE	0	35	4	-	-	12	12	-	-	30	PRICE	ASPD	3	1., 3., 4., 5., 6.
S2	SUPPLY	CEILING	PLAQUE	36	60	5	-	-	12	12	-	-	30	PRICE	ASPD	3	1., 3., 4., 5., 6.
S2	SUPPLY	CEILING	PLAQUE	61	95	6	-	-	12	12	-	-	30	PRICE	ASPD	3	1., 3., 4., 5., 6.
S2	SUPPLY	CEILING	PLAQUE	96	145	7	-	-	12	12	-	-	30	PRICE	ASPD	3	1., 3., 4., 5., 6.
S2	SUPPLY	CEILING	PLAQUE	146	205	8	-	-	12	12	-	-	30	PRICE	ASPD	3	1., 3., 4., 5., 6.
S3	SUPPLY	CEILING	CURVED VANE	0	75	-	6	4	L+1-3/4	W+1-3/4	-	-	30	PRICE	CVD	1.	1., 2., 3., 4., 5., 6.
S3	SUPPLY	CEILING	CURVED VANE	76	140	-	8	6	L+1-3/4	W+1-3/4	-	-	30	PRICE	CVD	1.	1., 2., 3., 4., 5., 6.
S3	SUPPLY	CEILING	CURVED VANE	141	225	-	10	8	L+1-3/4	W+1-3/4	-	-	30	PRICE	CVD	1.	1., 2., 3., 4., 5., 6.
S3	SUPPLY	CEILING	CURVED VANE	226	325	-	12	10	L+1-3/4	W+1-3/4	-	-	30	PRICE	CVD	1.	1., 2., 3., 4., 5., 6.
S3	SUPPLY	CEILING	CURVED VANE	326	445	-	14	12	L+1-3/4	W+1-3/4	-	-	30	PRICE	CVD	1.	1., 2., 3., 4., 5., 6.
S4	SUPPLY	SIDEWALL	LOUVERED	0	105	-	6	5	L+1-3/4	W+1-3/4	30	3/4	30	PRICE	22	1.	2., 3., 4., 6.
S4	SUPPLY	SIDEWALL	LOUVERED	106	255	-	10	6	L+1-3/4	W+1-3/4	30	3/4	30	PRICE	22	1.	2., 3., 4., 6.
S4	SUPPLY	SIDEWALL	LOUVERED	256	650	-	14	10	L+1-3/4	W+1-3/4	30	3/4	30	PRICE	22	1.	2., 3., 4., 6.
S4	SUPPLY	SIDEWALL	LOUVERED	651	1500	-	20	16	L+1-3/4	W+1-3/4	30	3/4	30	PRICE	22	1.	2., 3., 4., 6.
S4	SUPPLY	SIDEWALL	LOUVERED	1501	2980	-	30	24	L+1-3/4	W+1-3/4	30	3/4	30	PRICE	22	1.	2., 3., 4., 6.
R1	RETURN/EXHAUST	CEILING	EGGGRATE	0	130	-	6	6	12	12	-	-	30	PRICE	80		2., 3., 4., 6.
R1	RETURN/EXHAUST	CEILING	EGGGRATE	131	280	-	8	8	12	12	-	-	30	PRICE	80		2., 3., 4., 6.
R1	RETURN/EXHAUST	CEILING	EGGGRATE	281	1020	-	12	12	24	24	-	-	30	PRICE	80		2., 3., 4., 6.
R1	RETURN/EXHAUST	CEILING	EGGGRATE	801	2015	-	20	16	24	24	-	-	30	PRICE	80		2., 3., 4., 6.
R1	RETURN/EXHAUST	CEILING	EGGGRATE	2016	2225	-	22	20	24	24	-	-	30	PRICE	80		2., 3., 4., 6.
R2	RETURN	SIDEWALL	LOUVERED	0	80	-	6	5	L+1-3/4	W+1-3/4	-	3/4	30	PRICE	60		2., 3., 4., 6.
R2	RETURN	SIDEWALL	LOUVERED	81	125	-	8	6	L+1-3/4	W+1-3/4	-	3/4	30	PRICE	60		2., 3., 4., 6.
R2	RETURN	SIDEWALL	LOUVERED	126	185	-	10	8	L+1-3/4	W+1-3/4	-	3/4	30	PRICE	60		2., 3., 4., 6.
R2	RETURN	SIDEWALL	LOUVERED	186	280	-	12	10	L+1-3/4	W+1-3/4	-	3/4	30	PRICE	60		2., 3., 4., 6.
R2	RETURN	SIDEWALL	LOUVERED	261	435	-	18	12	L+1-3/4	W+1-3/4	-	3/4	30	PRICE	60		2., 3., 4., 6.
R2	RETURN	SIDEWALL	LOUVERED	436	605	-	24	14	L+1-3/4	W+1-3/4	-	3/4	30	PRICE	60		2., 3., 4., 6.
R2	RETURN	SIDEWALL	LOUVERED	1250	1720	-	48	20	L+1-3/4	W+1-3/4	-	3/4	30	PRICE	60		2., 3., 4., 6.
T1	TRANSFER	SIDEWALL	LOUVERED	0	330	-	20	16	L+1-3/4	W+1-3/4	-	-	30	PRICE	ATG		2., 4., 6.
T1	TRANSFER	SIDEWALL	LOUVERED	331	600	-	26	20	L+1-3/4	W+1-3/4	-	-	30	PRICE	ATG		2., 4., 6.

GENERAL CONTROL NOTES									
1. CONTROL POINTS FOR MAU-1 SHALL BE VISIBLE THROUGH A BACNET NETWORK INTERFACE CARD. A POINTS LIST IS NOT PROVIDED. THE POINTS SHOWN ON THE DIAGRAM ON DWG M600 SHALL BE REPRESENTATIVE OF THE MINIMUM POINTS REQUIRED TO BE AVAILABLE THROUGH THE INTERFACE. THE MANUFACTURER SHALL PROVIDE THEIR STANDARD CONTROL SCHEME CLOSELY RELATED TO SEQUENCE DEFINED ON CONTROL DIAGRAM.									
2. CONTROL POINTS FOR DOAS-1 SHALL BE VISIBLE THROUGH A BACNET NETWORK INTERFACE CARD. A POINTS LIST IS NOT PROVIDED. THE POINTS SHOWN ON THE DIAGRAM ON DWG M600 SHALL BE REPRESENTATIVE OF THE MINIMUM POINTS REQUIRED TO BE AVAILABLE THROUGH THE INTERFACE. THE MANUFACTURER SHALL PROVIDE THEIR STANDARD CONTROL SCHEME CLOSELY RELATED TO SEQUENCE DEFINED ON CONTROL DIAGRAM.									
3. CONTROL POINTS FOR RTU-3 SHALL BE VISIBLE THROUGH A BACNET NETWORK INTERFACE CARD. A POINTS LIST IS NOT PROVIDED. THE POINTS SHOWN ON THE DIAGRAM ON DWG M603 SHALL BE REPRESENTATIVE OF THE MINIMUM POINTS REQUIRED TO BE AVAILABLE THROUGH THE INTERFACE. THE MANUFACTURER SHALL PROVIDE THEIR STANDARD CONTROL SCHEME CLOSELY RELATED TO SEQUENCE DEFINED ON CONTROL DIAGRAM.									
4. SEE EQUIPMENT SCHEDULES AND CONTROL DIAGRAMS FOR EQUIPMENT REQUIRING VFDs.									
5. CONTROL POINTS LISTS INCLUDE ALL POINTS FOR DIFFERENT EQUIPMENT TYPES. SEE CONTROL DIAGRAMS FOR THOSE POINTS ASSOCIATED WITH INDIVIDUAL PIECES OF EQUIPMENT.									

CHW AHU CONTROL POINTS LIST													
POINT DESCRIPTION	HARDWARE POINTS						SOFTWARE POINTS						
	AI	AO	BI	BO	AV	BV	SCHED	TREND	ALARM	GRAPHIC			
DISCHARGE AIR TEMPERATURE	X				X			X	X	X	X		
MIXED AIR TEMPERATURE	X				X			X	X	X	X		
RETURN AIR TEMPERATURE	X				X			X	X	X	X		
COOLING COIL AIR TEMPERATURE	X				X			X	X	X	X		
MINIMUM OUTSIDE AIR TEMPERATURE	X				X			X	X	X	X		
SUPPLY AIR STATIC PRESSURE	X				X			X	X	X	X		
DISCHARGE AIR HUMIDITY	X												
RETURN AIR HUMIDITY	X				X			X	X	X	X		
OUTSIDE AIR HUMIDITY	X				X								
OUTSIDE AIR TEMPERATURE	X							X		X			
SUPPLY FAN FLOW	X				X			X	X	X	X		
RETURN AIR FLOW	X							X	X	X	X		
FREEZE STAT			X			X		X	X	X	X		
SUPPLY STATIC HIGH LIMIT			X			X		X	X	X	X		
RETURN STATIC LOW LIMIT			X			X		X	X	X	X		
HUMIDITY HIGH LIMIT			X			X		X	X	X	X		
PRE-FILTER PRESSURE DROP	X						X	X	X	X	X		
FINAL FILTER PRESSURE DROP	X						X	X	X	X	X		
FIRE ALARM SHUTDOWN			X						X	X	X		
FIRE ALARM SMOKE EVACUATION			X						X	X	X		
COOLING COIL VALVE		X			X			X	X	X	X		
MIN. OSA COOLING COIL VALVE		X			X			X	X	X	X		
MIN. OSA HEATING COIL VALVE		X			X			X	X	X	X		
HUMIDIFIER VALVE		X			X			X	X	X	X		
OUTSIDE AIR DAMPER		X						X	X	X	X		
RETURN AIR DAMPER		X						X	X	X	X		
RELIEF AIR DAMPER		X						X	X	X	X		
MINIMUM OUTSIDE AIR DAMPER		X						X	X	X	X		
SUPPLY FAN SPEED		X			X			X	X	X	X		
RETURN FAN SPEED		X			X			X	X	X	X		
SUPPLY FAN ENABLE				X		X		X	X	X	X		
SUPPLY FAN STATUS			X					X	X	X	X		
SUPPLY FAN X - CFM FLOW	X					X		X	X	X	X		
RETURN FAN X - CFM FLOW	X					X		X	X	X	X		
VFD ALARM			X					X	X	X	X		
VFD HERTZ	X							X	X	X	X		
VFD AMPS	X							X	X	X	X		

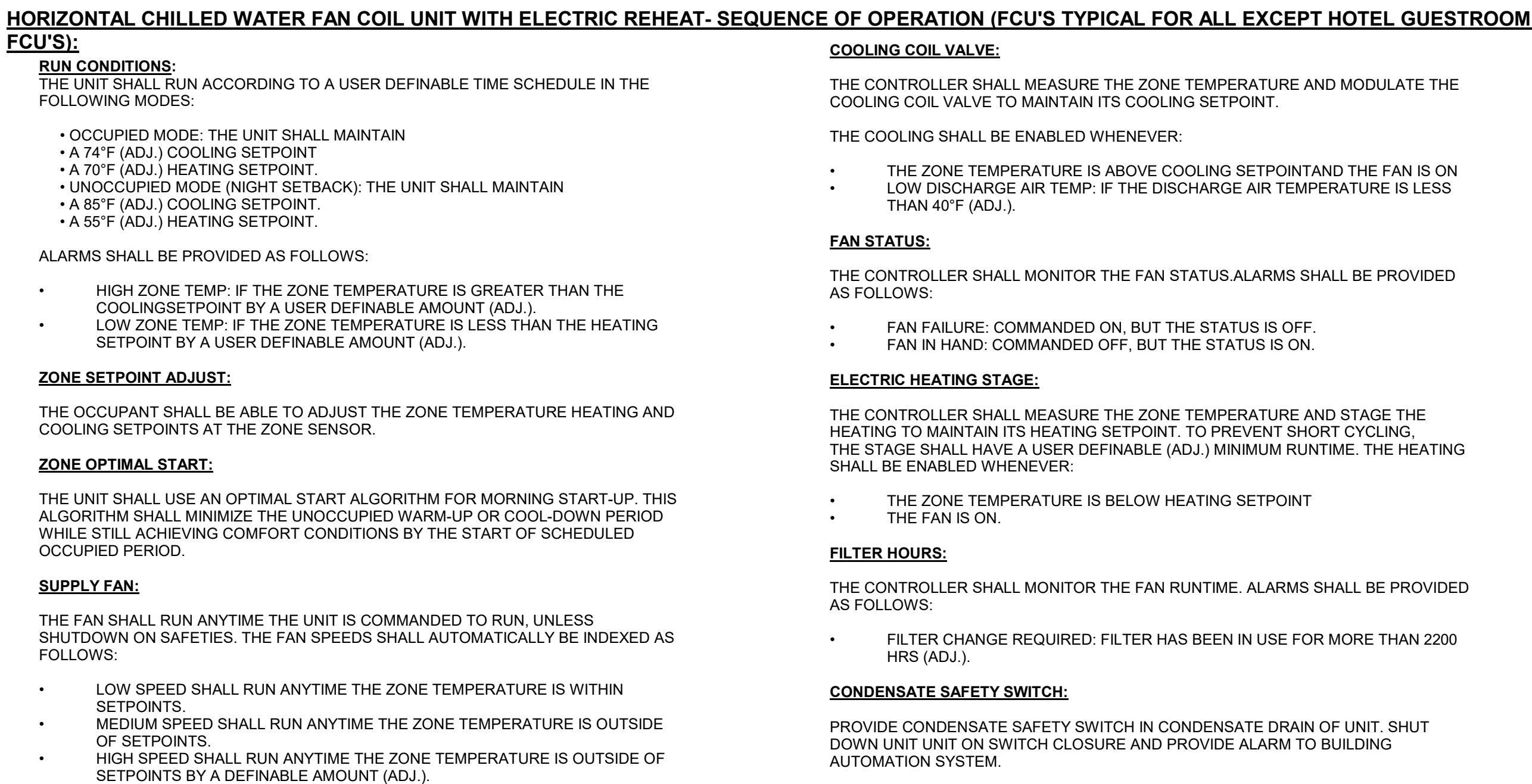
DBP-1 CONTROL POINTS LIST													
POINT NAME	HARDWARE POINTS						SOFTWARE POINTS						
	AI	AO	BI	BO	AV	BV	ALARM	TREND	SCHEDULE	COLOR GRAPHIC			
DOM. HOT WATER RETURN TEMPERATURE								X	X				
DOM. HOT WATER SUPPLY TEMPERATURE								X	X				
DOM. HOT WATER PUMP 1 STATUS								X	X				
DOM. HOT WATER PUMP 2 STATUS								X	X				
DOM. HOT WATER PUMP 1 START/STOP								X	X				
DOM. HOT WATER PUMP 2 START/STOP								X	X				
HIGH DOM. HOT WATER SUPPLY TEMP.													
LOW DOM. HOT WATER SUPPLY TEMP.													
DOM. HOT WATER PUMP 1 FAILURE													
DOM. HOT WATER PUMP 1 RUNNING IN HAND													
DOM. HOT WATER PUMP 2 FAILURE													
DOM. HOT WATER PUMP 2 RUNNING IN HAND													
DOM. HOT WATER PUMP 1 RUNTIME EXCEEDED													
DOM. HOT WATER PUMP 2 RUNTIME EXCEEDED													

CHILLED WATER SYSTEM CONTROL POINTS LIST													
POINT DESCRIPTION	HARDWARE POINTS						SOFTWARE POINTS						
	AI	AO	BI	BO	AV	BV	SCHED	TREND	ALARM	GRAPHIC			
CHILLER WATER DIFFERENTIAL PRESSURE	X							X	X				
CHILLER 1 WATER FLOW	X							X	X				
CHILLER 2 WATER FLOW	X							X	X				
CHILLER 1 WATER RETURN TEMPERATURE	X							X	X				
CHILLER 1 WATER SUPPLY TEMPERATURE		X						X	X				
CHILLER 2 WATER RETURN TEMPERATURE			X					X	X				
CHILLER 2 WATER SUPPLY TEMPERATURE				X				X	X				
MAIN CHILLED WATER RETURN TEMPERATURE				X				X	X				
MAIN CHILLED WATER SUPPLY TEMPERATURE				X				X	X				
CHILLED WATER PUMP 1 VFD SPEED				X				X	X				
CHILLED WATER PUMP 2 VFD SPEED				X				X	X				
CHILLED WATER BYPASS VALVE				X				X	X				
MAIN CHILLED WATER SUPPLY TEMPERATURE SETPOINT RESET				X				X	X				
CHILLER 1 EMERGENCY SHUTDOWN				X				X	X				
CHILLER 2 EMERGENCY SHUTDOWN				X				X	X				
MAIN CHILLED WATER ISOLATION VALVE STATUS				X				X	X				
CHILLED WATER PUMP 1 STATUS					X			X	X				
CHILLED WATER PUMP 2 STATUS					X			X	X				
CHILLED WATER PUMP 1 VFD					X			X	X				
CHILLED WATER PUMP 2 VFD					X			X	X				
CHILLED WATER PUMP 1 VFD ALARM								X	X				
CHILLED WATER PUMP 1 VFD AMP								X	X				
CHILLED WATER PUMP 2 VFD AMP								X	X				
CHILLED WATER PUMP 1 VFD HZ								X	X				
CHILLED WATER PUMP 2 VFD HZ								X	X				
CHILLER 1 STATUS							X	X	X				
CHILLER 2 STATUS							X	X	X				
CHILLED WATER ISOLATION VALVE								X	X				
CHILLED WATER PUMP 1 START/STOP			X					X	X				
CHILLED WATER PUMP 2 START/STOP			X					X	X				
CHILLER 1 ENABLE		X						X	X				
CHILLER 2 ENABLE								X	X				
OUTSIDE AIR TEMPERATURE								X	X				
CHILLED WATER DIFFERENTIAL PRESSURE SETPOINT								X	X				
CHILLED WATER FLOW SETPOINT								X	X				
CHILLED WATER ISOLATION VALVE FAILURE								X	X				
CHILLED WATER ISOLATION VALVE IN HAND								X	X				
CHILLED WATER PUMP 1 FAILURE								X	X				
CHILLED WATER PUMP 2 FAILURE								X	X				
CHILLED WATER PUMP 1 RUNNING IN HAND				X				X	X				
CHILLED WATER PUMP 2 RUNNING IN HAND				X				X	X				
HIGH CHILLED WATER DIFFERENTIAL PRESSURE				X				X	X				
LOW CHILLED WATER DIFFERENTIAL PRESSURE				X				X	X				
LOW CHILLED WATER				X				X	X				
CHILLER 1 RUNNING IN HAND				X				X	X				
CHILLER 2 RUNNING IN HAND				X				X	X				
HIGH MAIN CHILLED WATER SUPPLY TEMPERATURE				X				X	X				
LOW MAIN CHILLED WATER SUPPLY TEMPERATURE				X				X	X				
HIGH MAIN CHILLED WATER RETURN TEMPERATURE				X				X	X				
LOW MAIN CHILLED WATER RETURN TEMPERATURE				X				X	X				
CHILLER 1 FAILURE				X				X	X				
CHILLER 2 FAILURE				X				X	X				
LEAD CHILLER FAILURE				X				X	X				
				X				X	X				
				X				X	X				

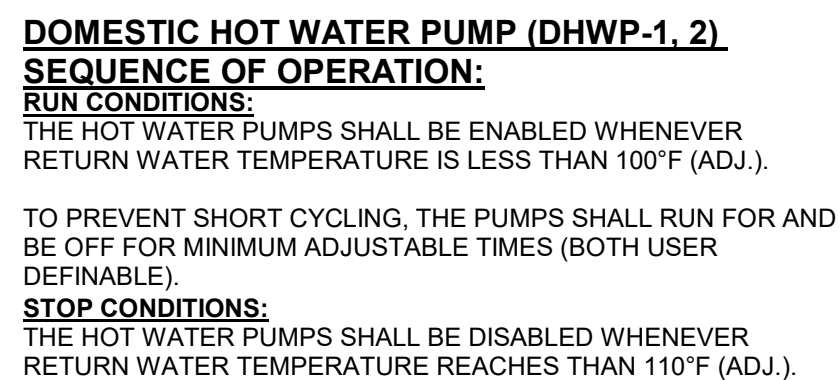
SINGLE ZONE VAV CHW AHU CONTROL POINT...													
POINT DESCRIPTION	HARDWARE POINTS						SOFTWARE POINTS						
	AI	AO	BI	BO	AV	BV	SCHED	TREND	ALARM	GRAPHIC			
FILTER DIFFERENTIAL PRESSURE	X							X	X				
BUILDING STATIC PRESSURE	X							X	X				
OUTSIDE AIRFLOW	X							X	X				
DISCHARGE AIR TEMPERATURE	X							X	X				
RETURN AIR TEMPERATURE	X							X	X				
ZONE TEMPERATURE	X							X	X				
MIXED AIR TEMPERATURE	X							X	X				
SUPPLY AIR CARBON DIOXIDE	X							X	X				
RETURN AIR HUMIDITY								X	X				
SUPPLY FAN VFD SPEED		X						X	X				
NATURAL GAS HEATING COIL VALVE		X						X	X				
COOLING COIL VALVE		X						X	X				
ZONE SETPOINT ADJUSTMENT		X						X	X				
OUTSIDE AIR DAMPER		X						X	X				
RETURN AIR DAMPER		X						X	X				
EXHAUST AIR DAMPER		X						X	X				
SUPPLY FAN START/STOP				X				X	X				
HIGH STATIC					X				X				
SUPPLY FAN STATUS				X				X	X				
SUPPLY FAN VFD ALARM								X	X				
SMOKE DETECTOR (RETURN)					X	X			X				
SMOKE DETECTOR (SUPPLY)					X	X			X				
CONDENSATE SAFETY SWITCH				X				X	X				

CHW FCU CONTROL POINTS LIST													
POINT DESCRIPTION	HARDWARE POINTS					SOFTWARE POINTS					GRAPHIC		
	AI	AO	BI	BO	AV	BV	SCHED	TREND	ALARM				
HEATING STAGE 1		X						X		X		X	
SCHEDULE										X		X	
ZONE TEMPERATURE	X							X		X		X	
ZONE TEMPERATURE ADJUST	X									X		X	
DISCHARGE AIR TEMPERATURE	X							X	X	X		X	
ZONE HUMIDITY	X									X		X	
HEATING SETPOINT								X		X		X	
COOLING SETPOINT		X						X	X	X		X	
FAN SPEED		X							X	X		X	
CHILLED WATER VALVE			X						X			X	
FAN STATUS												X	
HIGH ZONE HUMIDITY										X			
LOW ZONE HUMIDITY										X			
HIGH ZONE TEMPERATURE										X			
LOW ZONE TEMPERATURE										X			
HIGH DISCHARGE TEMPERATURE										X			
LOW DISCHARGE TEMPERATURE										X			
FILTER CHANGE REQUIRED										X			
FAN RUNNING IN HAND										X			
FAN FAILURE										X		X	





SCALE: N.T.S



SCALE: N.T.S



**RUN CONDITIONS:** THE UNIT SHALL ACCORDING TO A USER DEFINABLE TIME SCHEDULE IN THE FOLLOWING MODES:

- OCCUPIED MODE: THE UNIT SHALL MAINTAIN A 75°F (ADJ.) COOLING SETPOINT AND A 70°F (ADJ.) HEATING SETPOINT.
- UNOCCUPIED MODE: THE UNIT SHALL MAINTAIN AN 85°F (ADJ.) COOLING SETPOINT AND A 55°F (ADJ.) HEATING SETPOINT.

**ZONE SETPOINT ADJUST:** THE OCCUPANT SHALL BE ABLE TO ADJUST THE ZONE TEMPERATURE HEATING AND COOLING SETPOINTS AT THE ZONE SENSOR. THE ADJUSTMENT SHALL NOT BE MORE THAN 2°F (ADJ.) FROM THE TEMPERATURES OUTLINED IN THE PARAGRAPH B ABOVE.

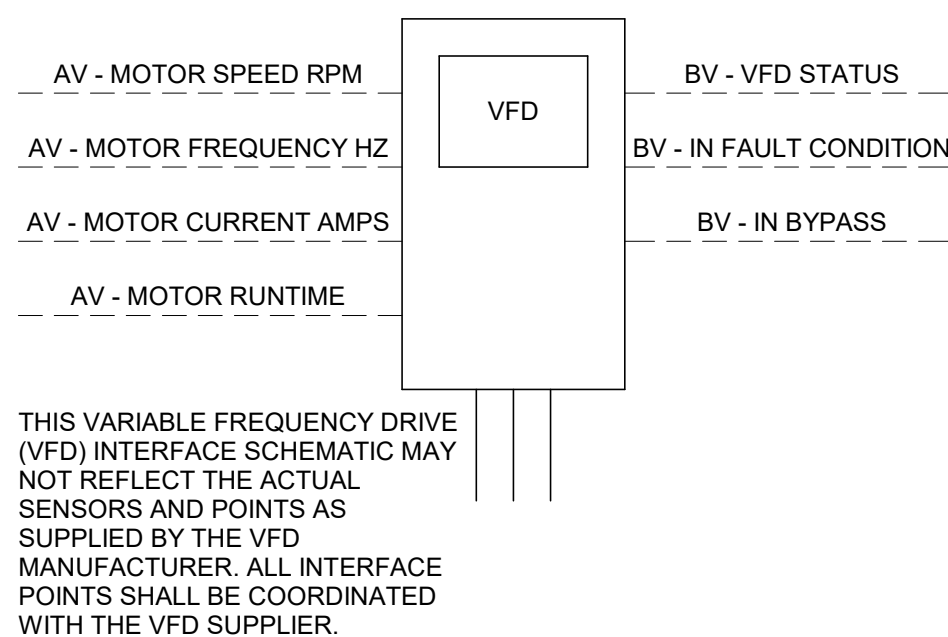
ZONE UNOCCUPIED OVERRIDE: A TIMED LOCAL OVERRIDE CONTROL SHALL ALLOW AN OCCUPANT TO OVERRIDE THE SCHEDULE AND PLACE THE UNIT INTO AN OCCUPIED MODE FOR AN ADJUSTABLE TIME INTERVAL. AT THE EXPIRATION OF THIS TIME, CONTROL OF THE UNIT SHALL AUTOMATICALLY RETURN TO THE SCHEDULE.

**ZONE OPTIMAL START:** THE UNIT SHALL USE AN OPTIMAL START ALGORITHM FOR MORNING START-UP. THIS ALGORITHM SHALL MINIMIZE THE UNOCCUPIED WARM-UP OR COOL-DOWN PERIOD WHILE STILL ACHIEVING COMFORT CONDITIONS BY THE START OF SCHEDULED OCCUPIED PERIOD. OPTIMAL START HEATING SETPOINT SHALL BE 3°F (ADJ.) BELOW THE OCCUPIED MODE SETPOINT.

**PRIMARY AIR DAMPER CONTROL:** THE UNIT SHALL MAINTAIN ZONE SETPOINTS BY CONTROLLING THE AIRFLOW THROUGH ONE OF THE FOLLOWING:

- OCCUPIED MODE:  
WHEN THE ZONE TEMPERATURE IS GREATER THAN ITS COOLING SETPOINT, THE ZONE DAMPER SHALL MODULATE BETWEEN THE MINIMUM (ADJ.) & MAXIMUM (ADJ.) AIRFLOW UNTIL THE ZONE IS SATISFIED.
- WHEN THE ZONE TEMPERATURE IS LESS THAN ITS HEATING SETPOINT, THE CONTROLLER SHALL ENABLE HEATING TO MAINTAIN THE ZONE TEMPERATURE AT ITS HEATING SETPOINT AT HEATING CFM AIR QUANTITY.

SCALE: N.T.S



CURRENT VFD STATUS AND OPERATING CONDITIONS SHALL BE MONITORED THROUGH ITS COMMUNICATIONS INTERFACE PORT. THE INTERFACE SHALL MONITOR AND TREND THE POINTS AS SHOWN ON THE POINTS LIST.

SCALE: N.T.S.

THESE PLANS AND SPECIFICATIONS HAVE BEEN PREPARED BY ME OR UNDER MY CLOSE PERSONAL SUPERVISION AND TO THE BEST OF MY KNOWLEDGE AND BELIEF THEY COMPLY WITH ALL CITY, STATE AND FEDERAL REQUIREMENTS, AND I AM NOT PROVIDING CONTRACT

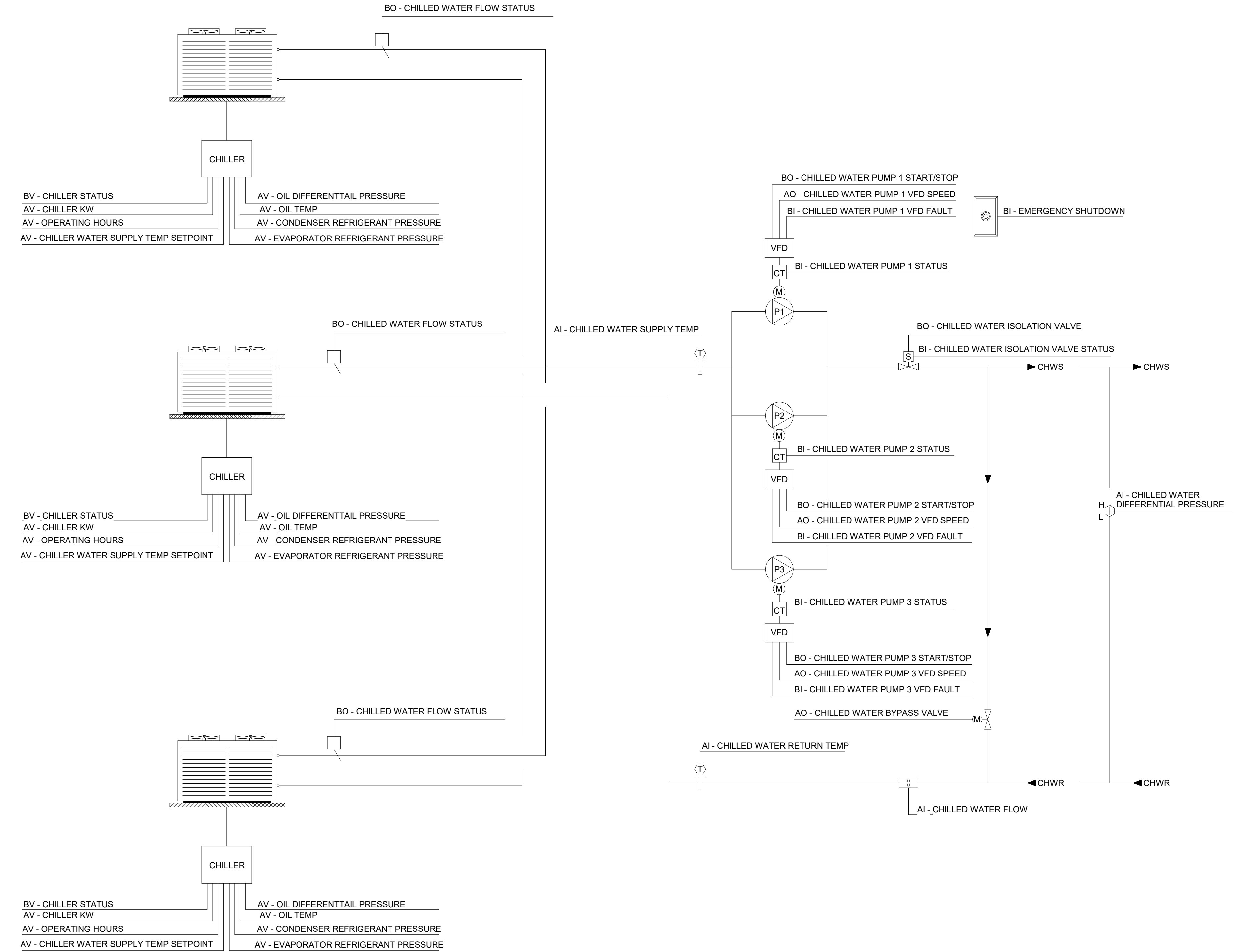


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[illegible]

MECHANICAL CONTROLS 2

PROJECT#: 1709  
PHASE: PERMIT  
TEAM: MEI  
CHECKER: RS  
SCALE: AS NOTED  
ISSUED: 06/05/2018



### 3 CENTRAL COOLING PLANT POINTS LIST 3

SCALE: 1/4" = 1'-0"

#### OUTSIDE AIR SENSOR SEQUENCE OF OPERATION:

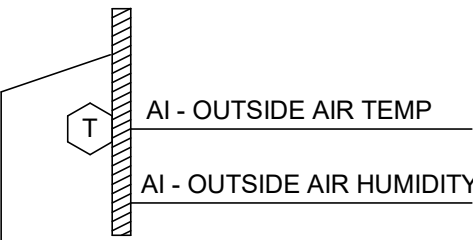
THE CONTROLLER SHALL MONITOR THE OUTSIDE AIR TEMPERATURE AND HUMIDITY AND CALCULATE THE OUTSIDE AIR ENTHALPY ON A CONTINUAL BASIS. THESE VALUES SHALL BE MADE AVAILABLE TO THE SYSTEM AT ALL TIMES.

IF AN OA TEMP SENSOR CANNOT BE READ, A DEFAULT VALUE OF 65°F WILL BE USED.

IF AN OA HUMIDITY SENSOR CANNOT BE READ, A DEFAULT VALUE OF 50 % WILL BE USED.

#### OUTSIDE AIR TEMPERATURE HISTORY:

THE CONTROLLER SHALL MONITOR AND RECORD THE HIGH AND LOW TEMPERATURE READINGS FOR THE OUTSIDE AIR. THESE READINGS SHALL BE RECORDED ON A DAILY, MONTH-TO-DATE, AND YEAR-TO-DATE BASIS.



### 4 OUTSIDE AIR SENSOR CONTROL DIAGRAM

SCALE: N.T.S.

#### AIR COOLED CHILLER PLANT CONTROL - SEQUENCE OF OPERATION (CH-1.CH-2):

##### CHILLER - RUN CONDITIONS:

THE CHILLER SHALL BE ENABLED TO RUN WHENEVER:

- A DEFINABLE NUMBER OF CHILLED WATER COILS NEED COOLING
- THE OUTSIDE AIR TEMPERATURE IS GREATER THAN 40°F (ADJ.).

TO PREVENT SHORT CYCLING, THE CHILLER SHALL RUN FOR AND BE OFF FOR MINIMUM ADJUSTABLE TIMES (BOTH USER DEFINABLE), UNLESS SHUTDOWN ON SAFETIES OR OUTSIDE AIR CONDITIONS. THE CHILLER SHALL RUN SUBJECT TO ITS OWN INTERNAL SAFETIES AND CONTROLS.

##### CHILLER LEAD/LAG OPERATION:

THE TWO CHILLERS SHALL OPERATE IN A LEAD/LAG FASHION. THE FOLLOWING SETPOINTS ARE RECOMMENDED VALUES. ALL SETPOINTS SHALL BE FIELD ADJUSTED DURING THE COMMISSIONING PERIOD TO MEET THE REQUIREMENTS OF ACTUAL FIELD CONDITIONS.

TO PREVENT SHORT CYCLING, THERE SHALL BE A USER DEFINABLE DELAY (ADJ.) BETWEEN STAGING UP OR DOWN, UNLESS SHUTDOWN ON SAFETIES OR FAILURE. EACH CHILLER SHALL RUN SUBJECT TO ITS OWN INTERNAL SAFETIES AND CONTROLS.

THE LEAD CHILLER SHALL RUN FIRST.

ON FAILURE OF THE LEAD CHILLER, THE LAG CHILLER SHALL RUN AND THE LEAD CHILLER SHALL TURN OFF.

ON INCREASING MAIN CHILLED WATER SUPPLY TEMPERATURE ABOVE 52°F (ADJ.), THE LAG CHILLER SHALL STAGE ON AND RUN IN UNISON WITH THE LEAD CHILLER TO MAINTAIN CHILLED WATER TEMPERATURE SETPOINT.

THE DESIGNATED LEAD CHILLER SHALL ROTATE UPON ONE OF THE FOLLOWING CONDITIONS (USER SELECTABLE):

- MANUALLY THROUGH A SOFTWARE SWITCH
- DAILY
- WEEKLY
- MONTHLY

ALARMS SHALL BE PROVIDED AS FOLLOWS:

- CHILLER 1 FAILURE: COMMANDED ON, BUT THE STATUS IS OFF.
- CHILLER 2 FAILURE: COMMANDED ON, BUT THE STATUS IS OFF.
- LEAD CHILLER FAILURE: THE LEAD CHILLER IS IN FAILURE AND THE LAG CHILLER IS ON.
- HIGH MAIN CHILLED WATER SUPPLY TEMP: IF THE MAIN CHILLED WATER SUPPLY TEMPERATURE IS GREATER THAN 56°F (ADJ.).
- LOW MAIN CHILLED WATER SUPPLY TEMP: IF THE MAIN CHILLED WATER SUPPLY TEMPERATURE IS LESS THAN 38°F (ADJ.).
- HIGH MAIN CHILLED WATER RETURN TEMP: IF THE MAIN CHILLED WATER RETURN TEMPERATURE IS GREATER THAN 68°F (ADJ.).
- LOW MAIN CHILLED WATER RETURN TEMP: IF THE MAIN CHILLED WATER RETURN TEMPERATURE IS LESS THAN 47°F (ADJ.).

##### EMERGENCY SHUTDOWN:

THE CHILLER SHALL SHUT DOWN AND AN ALARM GENERATED UPON RECEIVING AN EMERGENCY SHUTDOWN SIGNAL STATUS.

##### CHILLED WATER ISOLATION VALVE:

THE VALVE SHALL OPEN ANYTIME THE CHILLER IS CALLED TO RUN. THE VALVE SHALL ALSO OPEN WHENEVER THE CHILLED WATER PUMP RUNS FOR FREEZE PROTECTION. THE VALVE SHALL OPEN PRIOR TO THE CHILLER BEING ENABLED AND SHALL CLOSE ONLY AFTER THE CHILLER IS DISABLED. THE VALVE SHALL THEREFORE HAVE:

- A USER ADJUSTABLE DELAY ON START.
- A USER ADJUSTABLE DELAY ON STOP.

THE DELAY TIMES SHALL BE SET APPROPRIATELY TO ALLOW FOR ORDERLY CHILLED WATER SYSTEM START-UP, SHUTDOWN AND SEQUENCING.

ALARMS SHALL BE PROVIDED AS FOLLOWS:

- FAILURE: VALVE COMMANDED OPEN BUT THE STATUS INDICATES CLOSED.
- OPEN IN HAND: VALVE COMMANDED CLOSED BUT THE STATUS INDICATES OPEN.

##### CHILLED WATER PUMP LEAD/STANDBY OPERATION:

THE TWO CHILLED WATER PUMPS SHALL RUN ANYTIME THE CHILLER IS CALLED TO RUN. THE CHILLED WATER PUMP SHALL ALSO RUN FOR FREEZE PROTECTION WHENEVER THE OUTSIDE AIR TEMPERATURE IS LESS THAN A USER DEFINABLE SETPOINT (32°F - ADJ.).

THE LEAD PUMP SHALL START PRIOR TO THE CHILLER BEING ENABLED AND SHALL STOP ONLY AFTER THE CHILLER IS DISABLED. THE PUMP(S) SHALL THEREFORE HAVE:

- A USER ADJUSTABLE DELAY ON START.
- A USER ADJUSTABLE DELAY ON STOP.

THE DELAY TIMES SHALL BE SET APPROPRIATELY TO ALLOW FOR ORDERLY CHILLED WATER SYSTEM START-UP, SHUTDOWN AND SEQUENCING. CHILLED WATER PUMP LEAD/LAG OPERATION:

THE TWO VARIABLE SPEED CHILLED WATER PUMPS SHALL OPERATE IN A LEAD/LAG FASHION.

- THE LEAD PUMP SHALL RUN FIRST.
- ON FAILURE OF THE LEAD PUMP, THE LAG PUMP SHALL RUN AND THE LEAD PUMP SHALL TURN OFF.

ON DECREASING CHILLED WATER DIFFERENTIAL PRESSURE, THE LAG PUMP SHALL STAGE ON AND RUN IN UNISON WITH THE LEAD PUMP TO MAINTAIN CHILLED

THE DESIGNATED LEAD PUMP SHALL ROTATE UPON ONE OF THE FOLLOWING CONDITIONS (USER SELECTABLE):

- MANUALLY THROUGH A SOFTWARE SWITCH
- DAILY
- WEEKLY
- MONTHLY

ALARMS SHALL BE PROVIDED AS FOLLOWS:

CHILLED WATER PUMP 1

- FAILURE: COMMANDED ON, BUT THE STATUS IS OFF.
- RUNNING IN HAND: COMMANDED OFF, BUT THE STATUS IS ON.
- VFD FAULT.

CHILLED WATER PUMP 2

- FAILURE: COMMANDED ON, BUT THE STATUS IS OFF.
- RUNNING IN HAND: COMMANDED OFF, BUT THE STATUS IS ON.
- VFD FAULT.

##### CHILLED WATER DIFFERENTIAL PRESSURE CONTROL:

THE CONTROLLER SHALL MEASURE CHILLED WATER DIFFERENTIAL PRESSURE AND MODULATE THE LEAD CHILLED WATER PUMP VFD TO MAINTAIN ITS CHILLED WATER DIFFERENTIAL PRESSURE SETPOINT. THE FOLLOWING SETPOINTS ARE RECOMMENDED VALUES. ALL SETPOINTS SHALL BE FIELD ADJUSTED DURING THE COMMISSIONING PERIOD TO MEET THE REQUIREMENTS OF ACTUAL FIELD CONDITIONS.

THE CONTROLLER SHALL MODULATE CHILLED WATER PUMP SPEED TO MAINTAIN A CHILLED WATER DIFFERENTIAL PRESSURE OF 12LBF/IN2 (ADJ.). THE VFD MINIMUM SPEED SHALL NOT DROP BELOW 10% (ADJ.). ON DROPPING CHILLED WATER DIFFERENTIAL PRESSURE, THE VFDS SHALL STAGE ON AND RUN TO MAINTAIN SETPOINT AS FOLLOWS:

- THE CONTROLLER SHALL MODULATE THE LEAD VFD TO MAINTAIN SETPOINT.
- IF THE LEAD VFD SPEED IS GREATER THAN A SETPOINT OF 90% (ADJ.), THE LAG VFD SHALL STAGE ON.
- THE LAG VFD SHALL RAMP UP TO MATCH THE LEAD VFD SPEED AND THEN RUN IN UNISON WITH THE LEAD VFD TO MAINTAIN SETPOINT.

ON RISING CHILLED WATER DIFFERENTIAL PRESSURE, THE VFDS SHALL STAGE OFF AS FOLLOWS:

- IF THE VFDS SPEEDS THEN DROPS BACK TO 60% (ADJ.) BELOW SETPOINT, THE LAG VFD SHALL STAGE OFF.
- THE LEAD VFD SHALL CONTINUE TO RUN TO MAINTAIN SETPOINT.

ALARMS SHALL BE PROVIDED AS FOLLOWS:

- HIGH CHILLED WATER DIFFERENTIAL PRESSURE: IF THE CHILLED WATER DIFFERENTIAL PRESSURE IS 25% (ADJ.) GREATER THAN SETPOINT.
- LOW CHILLED WATER DIFFERENTIAL PRESSURE: IF THE CHILLED WATER DIFFERENTIAL PRESSURE IS 25% (ADJ.) LESS THAN SETPOINT.

##### CHILLED WATER BYPASS VALVE - MINIMUM FLOW CONTROL:

THE CONTROLLER SHALL MEASURE CHILLED WATER FLOW THROUGH THE CHILLER AND, AS THE CHILLED WATER FLOW DROPS BELOW SETPOINT, THE CONTROLLER SHALL MODULATE THE CHILLED WATER BYPASS VALVE OPEN TO MAINTAIN THE MINIMUM CHILLED WATER FLOW SETPOINT. ALARMS SHALL BE PROVIDED AS FOLLOWS:

- LOW CHILLED WATER FLOW: IF THE CHILLED WATER FLOW IS 25% (ADJ.) LESS THAN SETPOINT.

##### CHILLER START-UP:

THE CHILLER SHALL BE ENABLED AT A USER ADJUSTABLE TIME AFTER PUMP STATUSES ARE PROVEN ON. THE CHILLER SHALL THEREFORE HAVE A USER ADJUSTABLE DELAY ON START.

THE DELAY TIME SHALL BE SET APPROPRIATELY TO ALLOW FOR ORDERLY CHILLED WATER SYSTEM START-UP, SHUTDOWN AND SEQUENCING.

THE CHILLER SHALL RUN SUBJECT TO ITS OWN INTERNAL SAFETIES AND CONTROLS.

ALARMS SHALL BE PROVIDED AS FOLLOWS:

- CHILLER FAILURE: COMMANDED ON, BUT THE STATUS IS OFF.
- CHILLER RUNNING IN HAND: COMMANDED OFF, BUT THE STATUS IS ON.

##### CHILLED WATER SUPPLY TEMPERATURE - SETPOINT RESET:

THE CHILLED WATER SUPPLY TEMPERATURE SETPOINT SHALL RESET USING A TRIM AND RESPOND ALGORITHM BASED ON COOLING REQUIREMENTS.

THE CHILLED WATER SUPPLY TEMPERATURE SETPOINT SHALL RESET TO A LOWER VALUE AS THE FACILITY'S CHILLED WATER VALVES OPEN BEYOND A USER DEFINABLE THRESHOLD (90% OPEN, TYP.). ONCE THE CHILLED WATER COILS ARE SATISFIED (VALVES CLOSING) THEN THE CHILLED WATER SUPPLY TEMPERATURE SETPOINT SHALL GRADUALLY RISE OVER TIME TO REDUCE COOLING ENERGY USE.

##### CHILLED WATER TEMPERATURE MONITORING:

THE FOLLOWING TEMPERATURES SHALL BE MONITORED:

- CHILLED WATER SUPPLY.
- CHILLED WATER RETURN.

ALARMS SHALL BE PROVIDED AS FOLLOWS:

- HIGH CHILLED WATER SUPPLY TEMP: IF THE CHILLED WATER SUPPLY TEMPERATURE IS GREATER THAN 55°F (ADJ.).
- LOW CHILLED WATER SUPPLY TEMP: IF THE CHILLED WATER SUPPLY TEMPERATURE IS LESS THAN 36°F (ADJ.).

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CERTIFIED CORRECT

STATE OF LOUISIANA  
RAYMOND E. SMITH  
LICENSE No. 36823  
REGISTERED PROFESSIONAL ENGINEER  
MECHANICAL ENGINEERING

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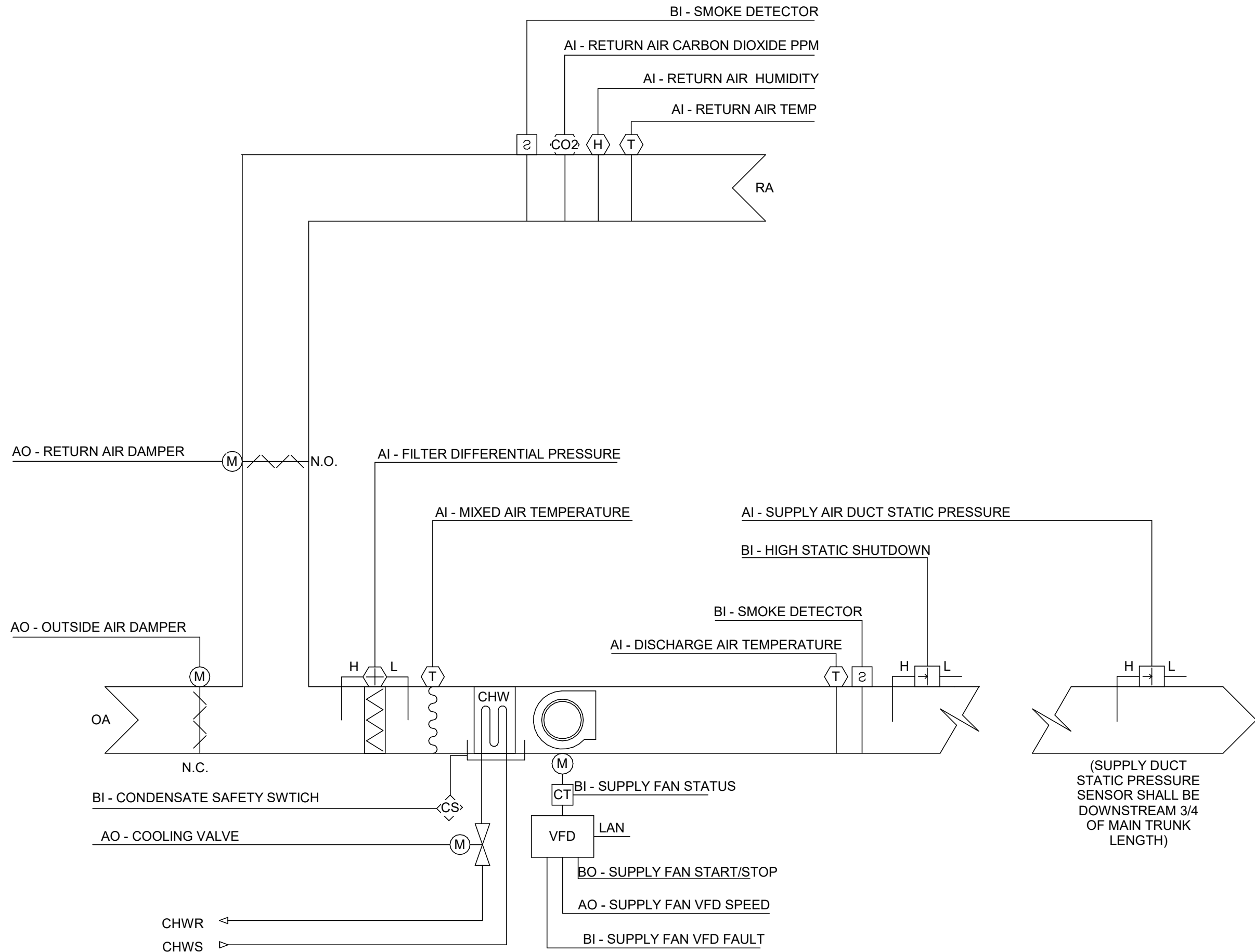
REVISION HISTORY				

MECHANICAL CONTROLS 3

PROJECT#: 1709  
PHASE: PERMIT  
TEAM: MEI  
CHECKER: RS  
SCALE: AS NOTED  
ISSUED: 06/05/2018

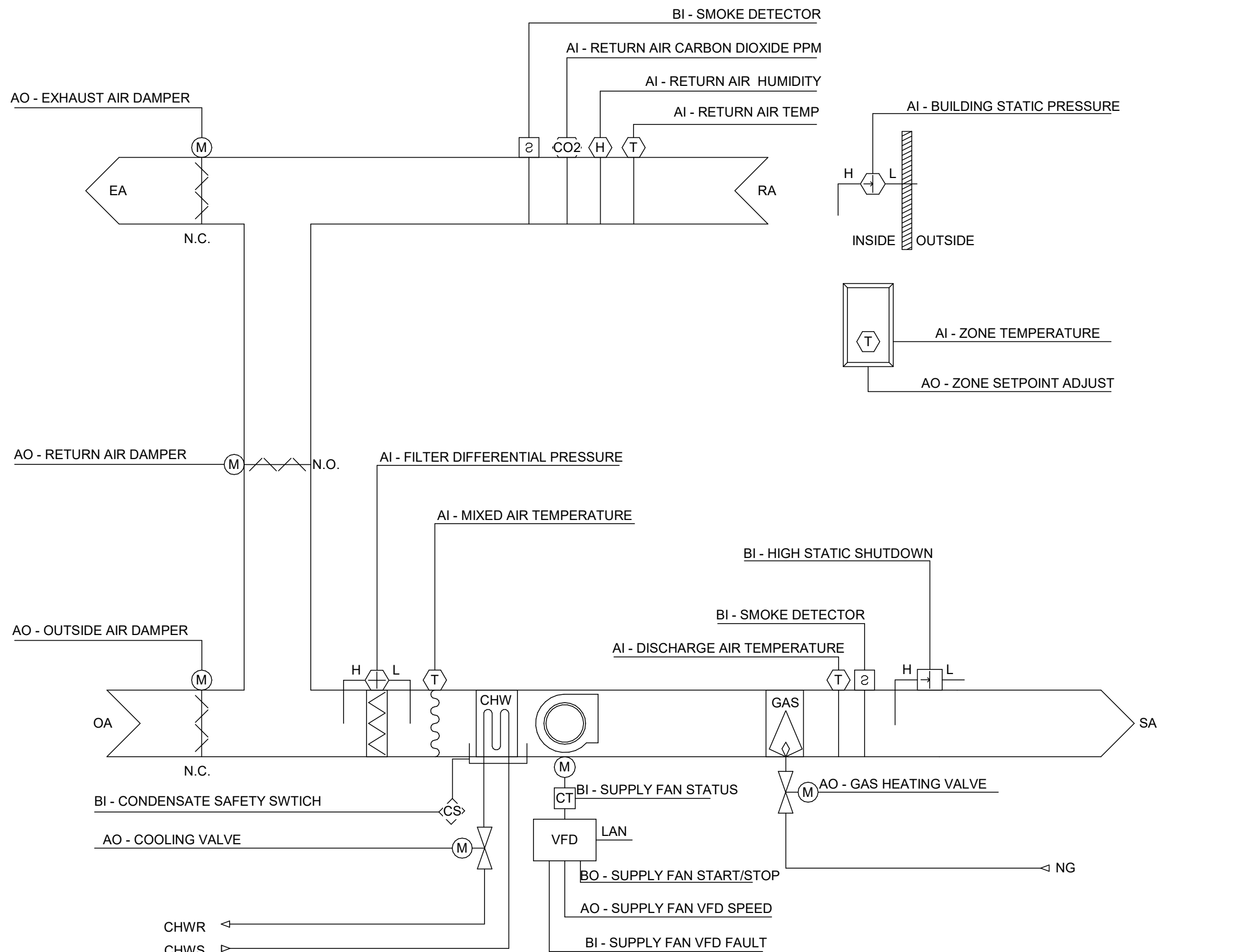
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Tel. 504-586-1725

M7.3



## 1 VAV AIR HANDLING UNIT SCHEMATIC

SCALE: NTS



## 3 SINGLE ZONE VAV ROOFTOP AIR HANDLING UNIT SCHEMATIC - MODULATING GAS

SCALE: NTS

### MULTI-ZONE VAV ROOFTOP AIR HANDLING UNIT - SEQUENCE OF OPERATION (AHU-1):

#### RUN CONDITIONS:

THE UNIT SHALL RUN ACCORDING TO A USER DEFINABLE TIME SCHEDULE IN THE FOLLOWING MODES:

- OCCUPIED MODE: THE UNIT SHALL MAINTAIN
  - A 74°F (ADJ.) COOLING SETPOINT
  - A 70°F (ADJ.) HEATING SETPOINT.

UNOCCUPIED MODE (NIGHT SETBACK): THE UNIT SHALL MAINTAIN
 

- A 85°F (ADJ.) COOLING SETPOINT.
- A 55°F (ADJ.) HEATING SETPOINT.

THE OCCUPANT SHALL BE ABLE TO OVERRIDE AUTOMATIC OPERATION THROUGH THE ZONE SENSOR AS FOLLOWS:

ADJUST THE COOLING AND HEATING SETPOINTS

SELECT THE DESIRED OPERATION MODE

- OFF
- ON

ALARMS SHALL BE PROVIDED AS FOLLOWS:

- HIGH STATIC SHUTDOWN: THE UNIT SHALL SHUTDOWN AND GENERATE AN ALARM UPON RECEIVING A HIGH STATIC SHUTDOWN SIGNAL.
- SUPPLY/RETURN AIR SMOKE DETECTION: THE UNIT SHALL SHUTDOWN AND GENERATE AN ALARM UPON RECEIVING A SUPPLY AIR SMOKE DETECTOR STATUS.

EMERGENCY SHUTDOWN:

THE UNIT SHALL SHUT DOWN AND GENERATE AN ALARM UPON RECEIVING AN EMERGENCY SHUTDOWN SIGNAL.

#### SUPPLY FAN:

THE FAN SHALL RUN ANYTIME THE UNIT IS COMMANDED TO RUN, UNLESS SHUTDOWN ON SAFETIES. TO PREVENT SHORT CYCLING, THE SUPPLY FAN SHALL HAVE A USER DEFINABLE (ADJ.) MINIMUM RUNTIME.

ALARMS SHALL BE PROVIDED AS FOLLOWS:

- SUPPLY FAN FAILURE: COMMANDED ON BUT STATUS IS OFF.
- SUPPLY FAN IN HAND: COMMANDED OFF BUT STATUS IS ON.
- SUPPLY FAN RUNTIME EXCEEDED: STATUS RUNTIME EXCEEDS A USER DEFINABLE LIMIT (ADJ.).

#### OUTSIDE AIR DAMPER:

- OUTSIDE AIR DAMPER: IN OCCUPIED MODE THE DAMPER SHALL MODULATE TO MAINTAIN THE SPACE CO2 LEVEL BELOW 1100 PPM(ADJ.). IN UNOCCUPIED MODE THE OUTSIDE AIR DAMPER IS FULLY CLOSED.
- RETURN AIR DAMPER: IN OCCUPIED MODE THE RETURN AIR DAMPER SHALL MODULATE TO MAINTAIN THE SUPPLY AIR FLOW. IN OCCUPIED MODE THE RETURN AIR DAMPER IS FULL OPEN.
- EXHAUST AIR DAMPER: IN OCCUPIED MODE THE EXHAUST AIR DAMPER IS OPEN. IN UNOCCUPIED MODE THE EXHAUST AIR DAMPER IS CLOSED.

#### SUPPLY AIR DUCT STATIC PRESSURE CONTROL:

THE CONTROLLER SHALL MEASURE DUCT STATIC PRESSURE AND MODULATE THE SUPPLY FAN VFD SPEED TO MAINTAIN A DUCT STATIC PRESSURE SET POINT. SPEED SHALL NOT DROP BELOW 20% (ADJ.). THE STATIC PRESSURE SET POINT SHALL BE RESET TO MAINTAIN THE "CRITICAL ZONE" VAV AIR DAMPER POSITION AT LEAST 75% OPEN. ALL VAV AIR DAMPERS SHALL BE POLLED TO DETERMINE THE "CRITICAL ZONE".

- INITIAL DUCT STATIC PRESSURE SETPOINT SHALL BE 1.5" W.C. (ADJ.)
- AS COOLING DEMAND INCREASES, THE SET POINT SHALL INCREMENTALLY RESET UP TO A MAXIMUM OF 1.8" W.C. (ADJ.)
- AS COOLING DEMAND DECREASES, THE SET POINT SHALL INCREMENTALLY RESET DOWN TO A MINIMUM OF 1.3" W.C. (ADJ.)

#### ZONE TEMPERATURE CONTROL:

THE UNIT SHALL MAINTAIN ZONE SETPOINTS BY CONTROLLING THE SUPPLY FAN SPEED AND CONTROL VAVLES AS OUTLINED BELOW:

#### COOLING MODE:

- FAN CONTROL: THE CONTROLLER SHALL MEASURE ZONE TEMPERATURE AND MODULATE THE SUPPLY FAN VFD SPEED TO MAINTAIN SPACE COOLING SETPOINT. THE MIN. VFD SPEED SHALL BE 20HZ(ADJ.) DURING COOLING MODE.
- COOLING COIL VALVE: THE CONTROLLER SHALL MEASURE SUPPLY AIR TEMPERATURE AND MODULATE THE COOLING COIL CONTROL VALVE TO MAINTAIN A SUPPLY LAT OF 55 DEG. F (ADJ.).

#### DEHUMIDIFICATION MODE:

- THE CONTROLLER SHALL MEASURE THE ZONE RELATIVE HUMIDITY. WHEN ZONE RH RISES ABOVE 70% (ADJ.) DEHUMIDIFICATION SHALL BE ENABLED. WHEN ZONE RH IS BELOW 55%(ADJ.) DEHUMIDIFICATION MODE SHALL BE DISABLED. WHEN OUTDOOR TEMP. ARE BELOW 55 DEG. F DEHUMIDIFICATION MODE SHALL BE DISABLED.
- FAN CONTROL: THE CONTROLLER SHALL MEASURE ZONE TEMPERATURE AND MODULATE SUPPLY FAN VFD SPEED TO MAINTAIN ZONE HEATING TEMP. SETPOINT. FAN VFD SPEED SHALL DECREASE AS TEMPERATURE DROPS BELOW HEATING SETPOINT. MINIMUM VFD SPEED SHALL BE 20HZ (ADJ.).
- COOLING COIL VALVE: THE CONTROLLER SHALL MEASURE SUPPLY AIR TEMPERATURE AND MODULATE THE COOLING COIL VALVE TO MAINTAIN A SUPPLY LAT OF 55 DEG. F (ADJ.)

#### DISCHARGE AIR TEMPERATURE:

THE CONTROLLER SHALL MONITOR THE DISCHARGE AIR TEMPERATURE.

ALARMS SHALL BE PROVIDED AS FOLLOWS:

- HIGH DISCHARGE AIR TEMP: IF THE DISCHARGE AIR TEMPERATURE IS GREATER THAN 120°F (ADJ.).
- LOW DISCHARGE AIR TEMP: IF THE DISCHARGE AIR TEMPERATURE IS LESS THAN 40°F (ADJ.).

#### FAN STATUS:

THE CONTROLLER SHALL MONITOR THE FAN STATUS.

ALARMS SHALL BE PROVIDED AS FOLLOWS:

- FAN FAILURE: COMMANDED ON, BUT THE STATUS IS OFF.
- FAN IN HAND: COMMANDED OFF, BUT THE STATUS IS ON.
- FAN RUNTIME EXCEEDED: FAN STATUS RUNTIME EXCEEDS A USER DEFINABLE LIMIT (ADJ.).

#### CONDENSATE SAFETY SWITCH:

PROVIDE CONDENSATE SAFETY SWITCH IN UNIT SAFETY PAN OVERFLOW DRAIN. SHUT DOWN UNIT UNIT ON SWITCH CLOSURE AND PROVIDE ALARM TO BUILDING AUTOMATION SYSTEM.

### SINGLE ZONE VAV ROOFTOP AIR HANDLING UNIT - SEQUENCE OF OPERATION (RTU-1,2, AND 3):

#### RUN CONDITIONS:

THE UNIT SHALL RUN ACCORDING TO A USER DEFINABLE TIME SCHEDULE IN THE FOLLOWING MODES:

- OCCUPIED MODE: THE UNIT SHALL MAINTAIN
  - A 74°F (ADJ.) COOLING SETPOINT
  - A 70°F (ADJ.) HEATING SETPOINT.

UNOCCUPIED MODE (NIGHT SETBACK): THE UNIT SHALL MAINTAIN
 

- A 85°F (ADJ.) COOLING SETPOINT.
- A 55°F (ADJ.) HEATING SETPOINT.

THE OCCUPANT SHALL BE ABLE TO OVERRIDE AUTOMATIC OPERATION THROUGH THE ZONE SENSOR AS FOLLOWS:

ADJUST THE COOLING AND HEATING SETPOINTS

SELECT THE DESIRED OPERATION MODE

- OFF
- ON

ALARMS SHALL BE PROVIDED AS FOLLOWS:

- HIGH STATIC SHUTDOWN: THE UNIT SHALL SHUTDOWN AND GENERATE AN ALARM UPON RECEIVING A HIGH STATIC SHUTDOWN SIGNAL.
- SUPPLY/RETURN AIR SMOKE DETECTION: THE UNIT SHALL SHUTDOWN AND GENERATE AN ALARM UPON RECEIVING A SUPPLY AIR SMOKE DETECTOR STATUS.

EMERGENCY SHUTDOWN:

THE UNIT SHALL SHUT DOWN AND GENERATE AN ALARM UPON RECEIVING AN EMERGENCY SHUTDOWN SIGNAL.

#### SUPPLY FAN:

THE FAN SHALL RUN ANYTIME THE UNIT IS COMMANDED TO RUN, UNLESS SHUTDOWN ON SAFETIES. TO PREVENT SHORT CYCLING, THE SUPPLY FAN SHALL HAVE A USER DEFINABLE (ADJ.) MINIMUM RUNTIME.

ALARMS SHALL BE PROVIDED AS FOLLOWS:

- SUPPLY FAN FAILURE: COMMANDED ON BUT STATUS IS OFF.
- SUPPLY FAN IN HAND: COMMANDED OFF BUT STATUS IS ON.
- SUPPLY FAN RUNTIME EXCEEDED: STATUS RUNTIME EXCEEDS A USER DEFINABLE LIMIT (ADJ.).

#### OUTSIDE AIR DAMPER:

- OUTSIDE AIR DAMPER: IN OCCUPIED MODE THE DAMPER SHALL MODULATE TO MAINTAIN THE SPACE CO2 LEVEL BELOW 1100 PPM(ADJ.). IN UNOCCUPIED MODE THE OUTSIDE AIR DAMPER IS FULLY CLOSED.
- RETURN AIR DAMPER: IN OCCUPIED MODE THE RETURN AIR DAMPER SHALL MODULATE TO MAINTAIN THE SUPPLY AIR FLOW. IN OCCUPIED MODE THE RETURN AIR DAMPER IS FULL OPEN.
- EXHAUST AIR DAMPER: IN OCCUPIED MODE THE EXHAUST AIR DAMPER IS OPEN. IN UNOCCUPIED MODE THE EXHAUST AIR DAMPER IS CLOSED.

#### ZONE TEMPERATURE CONTROL:

THE UNIT SHALL MAINTAIN ZONE SETPOINTS BY CONTROLLING THE SUPPLY FAN SPEED AND CONTROL VAVLES AS OUTLINED BELOW:

#### HEATING MODE:

- FAN CONTROL: FAN VFD SPEED SHALL BE SET TO A VALUE THAT MAINTAINS SCHEDULED AIRFLOW. VALUE DETERMINED DURING TAB PROCESS.
- COOLING COIL VALVE CONTROL: COOLING COIL VALVE SHALL BE CLOSED.
- MODULATING GAS HEAT: NATURAL GAS HEATER SHALL BE ENABLED. HEATER SHALL MODULATE TO MAINTAIN SPACE HEATING SETPOINT.

#### COOLING MODE:

- FAN CONTROL: THE CONTROLLER SHALL MEASURE ZONE TEMPERATURE AND MODULATE THE SUPPLY FAN VFD SPEED TO MAINTAIN SPACE COOLING SETPOINT. THE MIN. VFD SPEED SHALL BE 20HZ(ADJ.) DURING COOLING MODE.
- COOLING COIL VALVE: THE CONTROLLER SHALL MEASURE SUPPLY AIR TEMPERATURE AND MODULATE THE COOLING COIL CONTROL VALVE TO MAINTAIN A SUPPLY LAT OF 55 DEG. F (ADJ.).
- MODULATING GAS HEAT: THE NATURAL GAS HEATER SHALL BE DISABLED.

#### DEHUMIDIFICATION MODE:

- THE CONTROLLER SHALL MEASURE THE ZONE RELATIVE HUMIDITY. WHEN ZONE RH RISES ABOVE 70% (ADJ.) DEHUMIDIFICATION SHALL BE ENABLED. WHEN ZONE RH IS BELOW 55%(ADJ.) DEHUMIDIFICATION MODE SHALL BE DISABLED. WHEN OUTDOOR TEMP. ARE BELOW 55 DEG. F DEHUMIDIFICATION MODE SHALL BE DISABLED.
- FAN CONTROL: THE CONTROLLER SHALL MEASURE ZONE TEMPERATURE AND MODULATE SUPPLY FAN VFD SPEED TO MAINTAIN ZONE HEATING TEMP. SETPOINT. FAN VFD SPEED SHALL DECREASE AS TEMPERATURE DROPS BELOW HEATING SETPOINT. MINIMUM VFD SPEED SHALL BE 20HZ (ADJ.).
- COOLING COIL VALVE: THE CONTROLLER SHALL MEASURE SUPPLY AIR TEMPERATURE AND MODULATE THE COOLING COIL VALVE TO MAINTAIN A SUPPLY LAT OF 55 DEG. F (ADJ.)
- MODULATING GAS HEAT: THE NATURAL GAS HEATER SHALL BE DISABLED.

#### FILTER STATUS:

- A DIFFERENTIAL PRESSURE SWITCH SHALL MONITOR DIFFERENTIAL PRESSURE ACROSS THE FILTER WHEN THE FAN IS RUNNING. IF SWITCH CLOSURES DURING OCCUPIED MODE, DIRTY FILTER ALARM SHALL BE ANNUNCIATED.

#### DISCHARGE AIR TEMPERATURE:

THE CONTROLLER SHALL MONITOR THE DISCHARGE AIR TEMPERATURE.

ALARMS SHALL BE PROVIDED AS FOLLOWS:

- HIGH DISCHARGE AIR TEMP: IF THE DISCHARGE AIR TEMPERATURE IS GREATER THAN 120°F (ADJ.).
- LOW DISCHARGE AIR TEMP: IF THE DISCHARGE AIR TEMPERATURE IS LESS THAN 40°F (ADJ.).

#### FAN STATUS:

THE CONTROLLER SHALL MONITOR THE FAN STATUS.

ALARMS SHALL BE PROVIDED AS FOLLOWS:

- FAN FAILURE: COMMANDED ON, BUT THE STATUS IS OFF.
- FAN IN HAND: COMMANDED OFF, BUT THE STATUS IS ON.
- FAN RUNTIME EXCEEDED: FAN STATUS RUNTIME EXCEEDS A USER DEFINABLE LIMIT (ADJ.).

#### CONDENSATE SAFETY SWITCH:

PROVIDE CONDENSATE SAFETY SWITCH IN UNIT SAFETY PAN OVERFLOW DRAIN. SHUT DOWN UNIT UNIT ON SWITCH CLOSURE AND PROVIDE ALARM TO BUILDING AUTOMATION SYSTEM.

CERTIFIED CORRECT

REVISION HISTORY				

MECHANICAL CONTROLS 4

PROJECT#: 1709  
PHASE: PERMIT  
TEAM: MEI  
CHECKER: RS  
SCALE: AS NOTED  
ISSUED: 06/05/2018





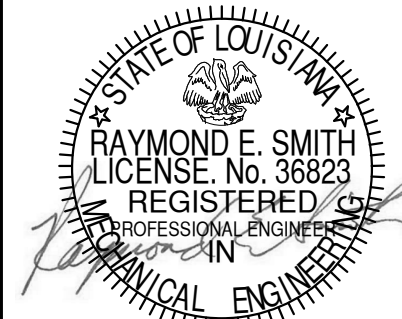




HARD ROCK  
1031 CANAL STREET  
NEW ORLEANS, LOUISIANA

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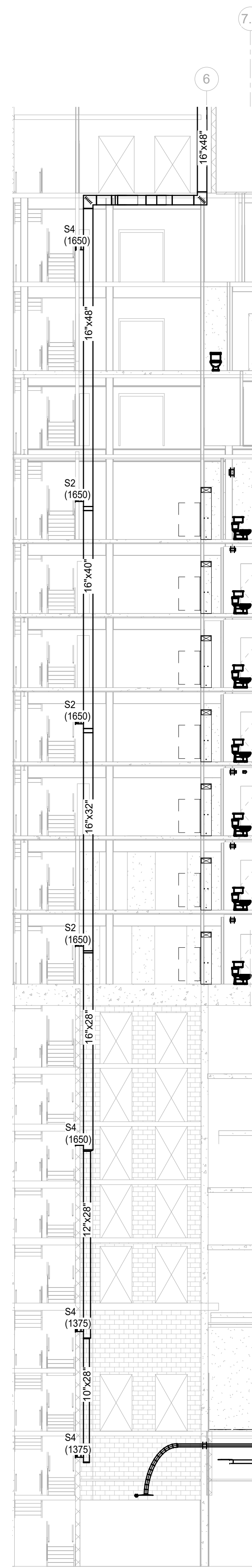
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RISER DIAGRAM

PROJECT#: 1709  
PHASE: PERMIT  
TEAM: MEI  
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SCALE: AS NOTED  
ISSUED: 06/05/2018



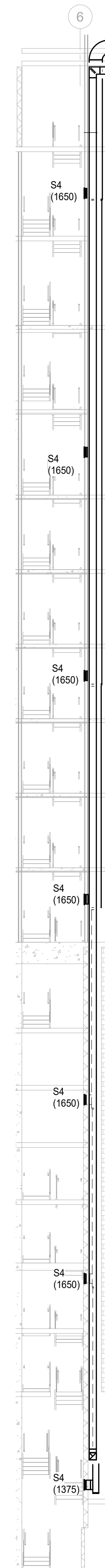
**CONSULTING ENGINEER**  
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New Orleans, Louisiana 70112-1033  
Tel. 504-586-1725

# M8.1



# 1 NORTH STAIRWELL - SECTION A-A

SCALE: 3/32" = 1'-0"



## 2 SOUTH STAIRWELL - SECTION B-B

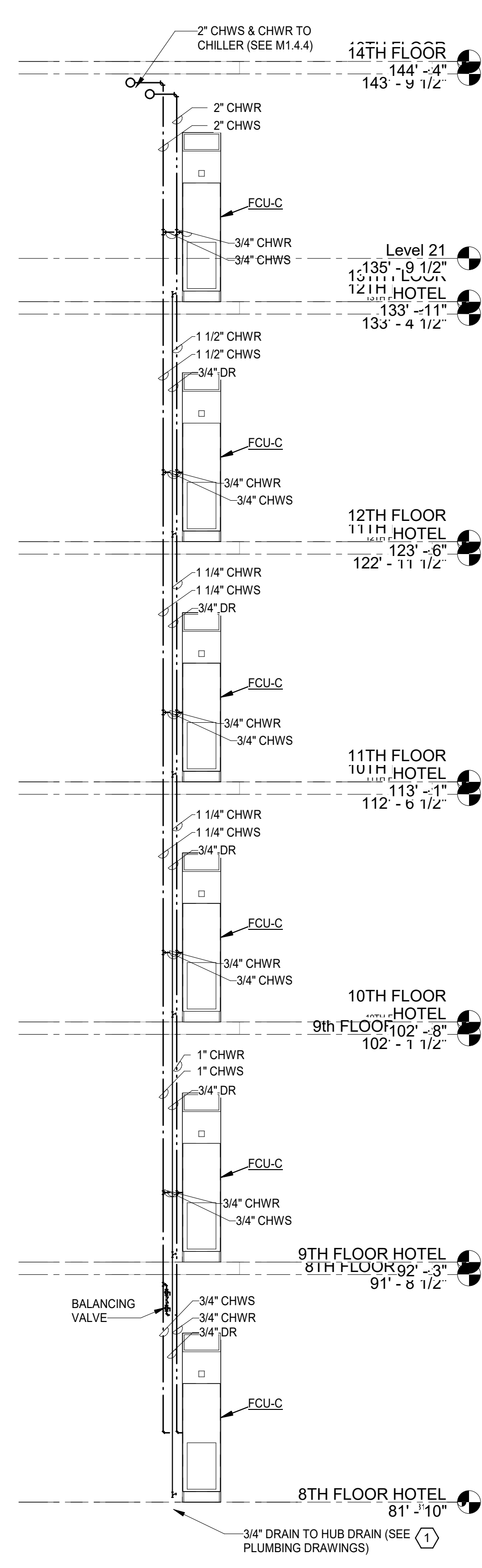
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PROJECT#: 1709  
PHASE: PERMIT  
TEAM: MEI  
CHECKER: RS  
SCALE: AS NOTED  
ISSUED: 06/05/2018

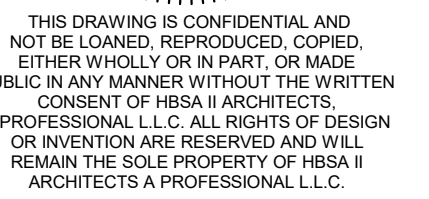
## M8.2

1 DRAINS MAY BE ROUTED TO PRIMARY STORM DRAIN SYSTEM AT CONTRACTORS DISCRETION. SEE PLUMBING DRAWINGS FOR NEARBY STORM DRAIN PIPES.



## 6 CHILLED WATER RISER 6

CERTIFIED CORRECT

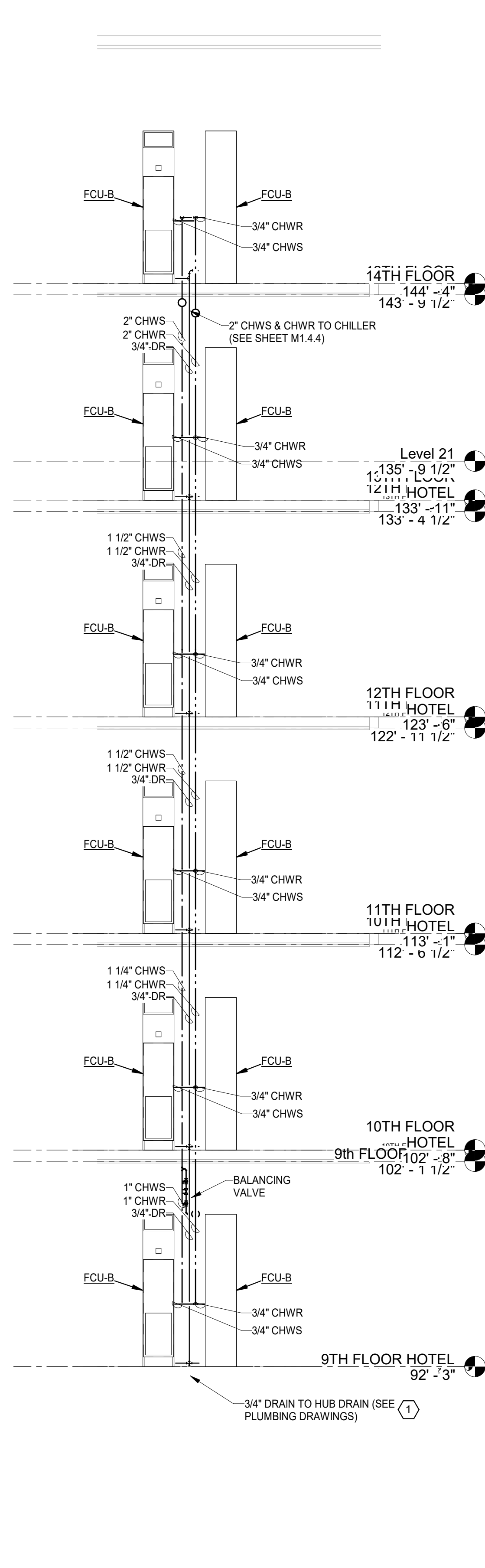
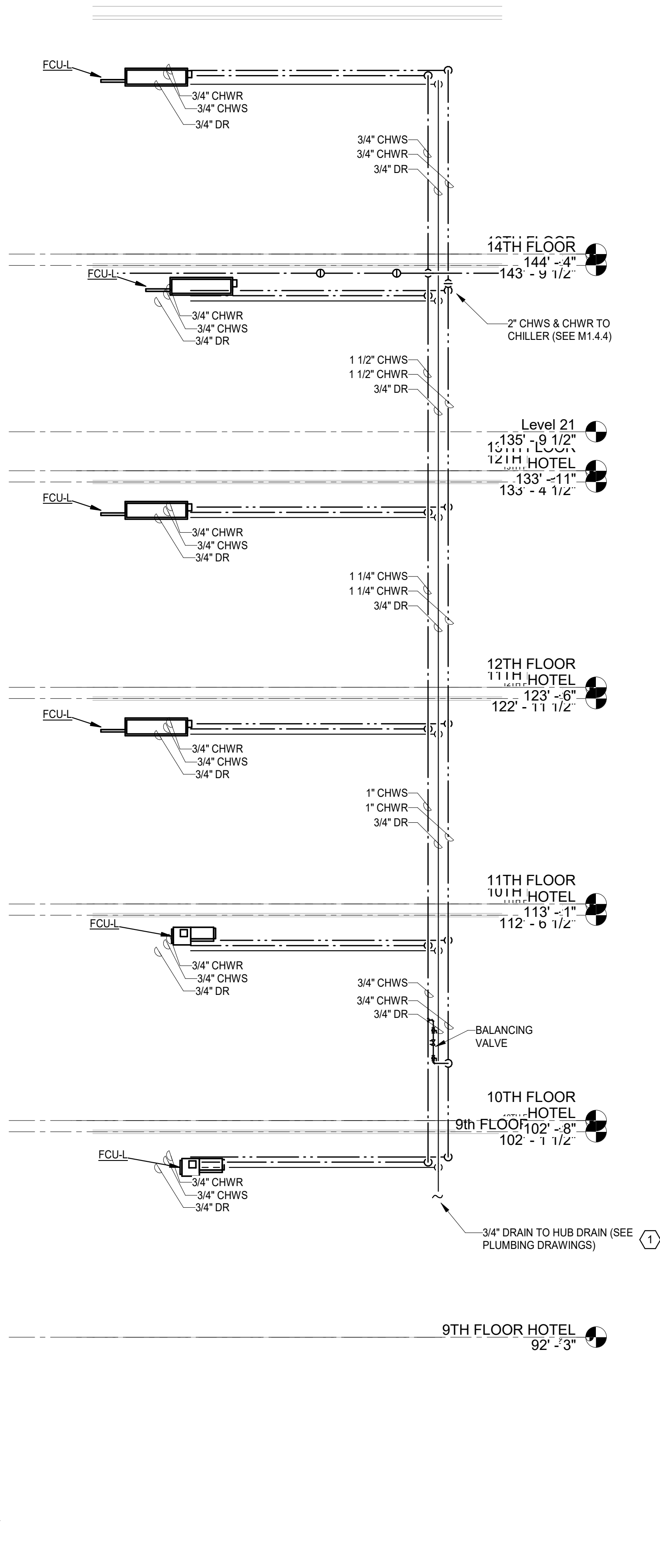
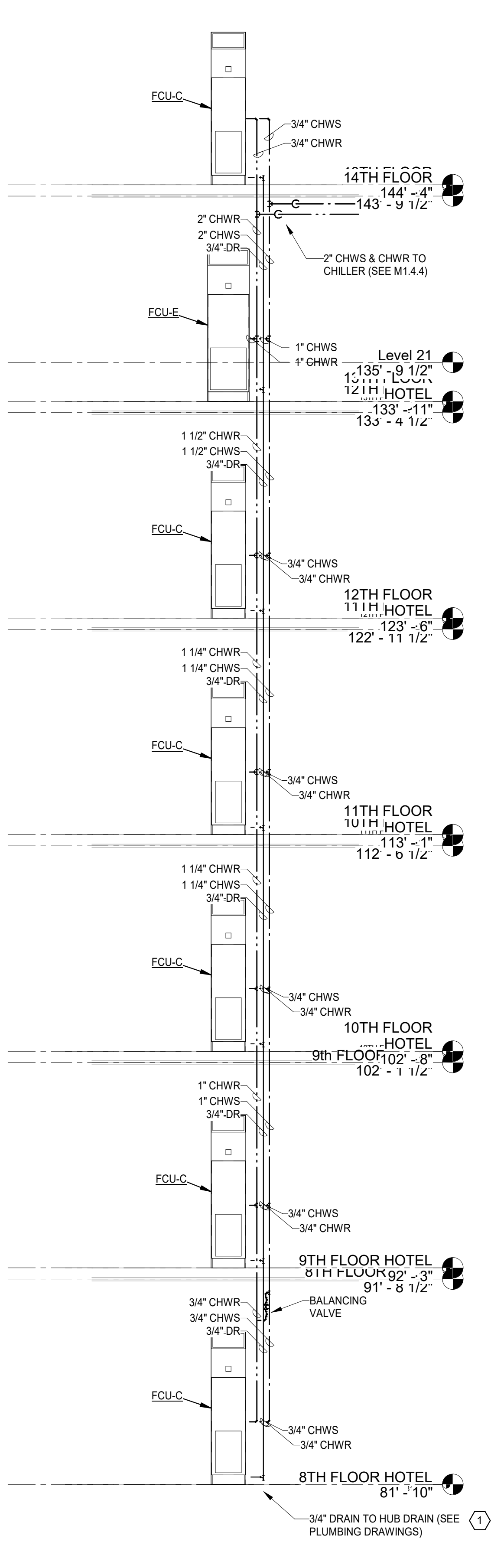
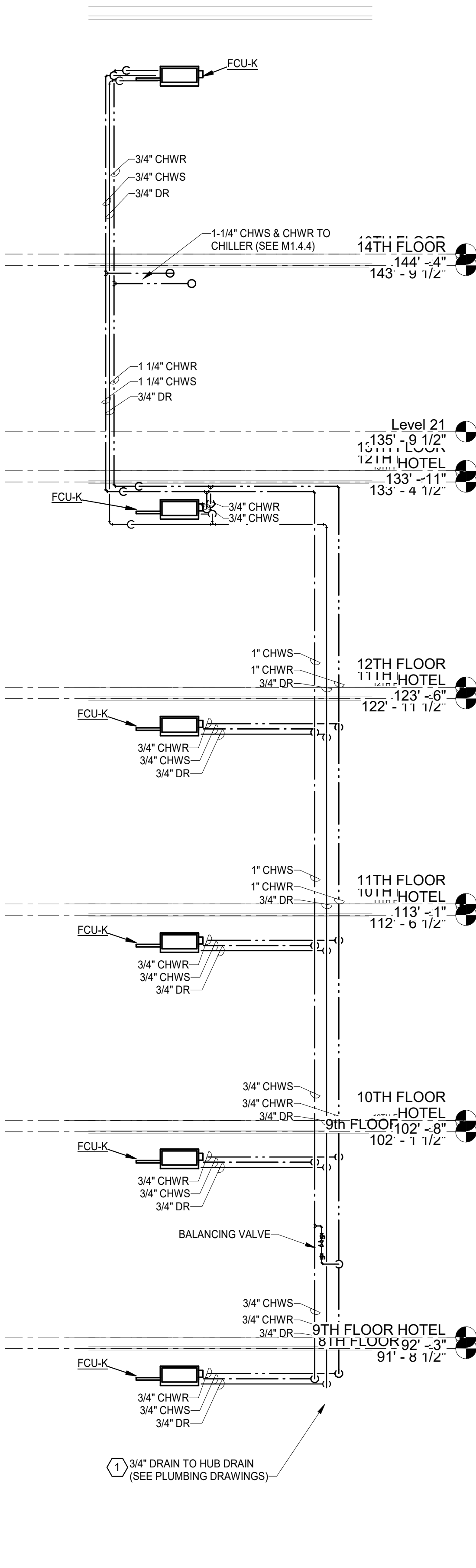
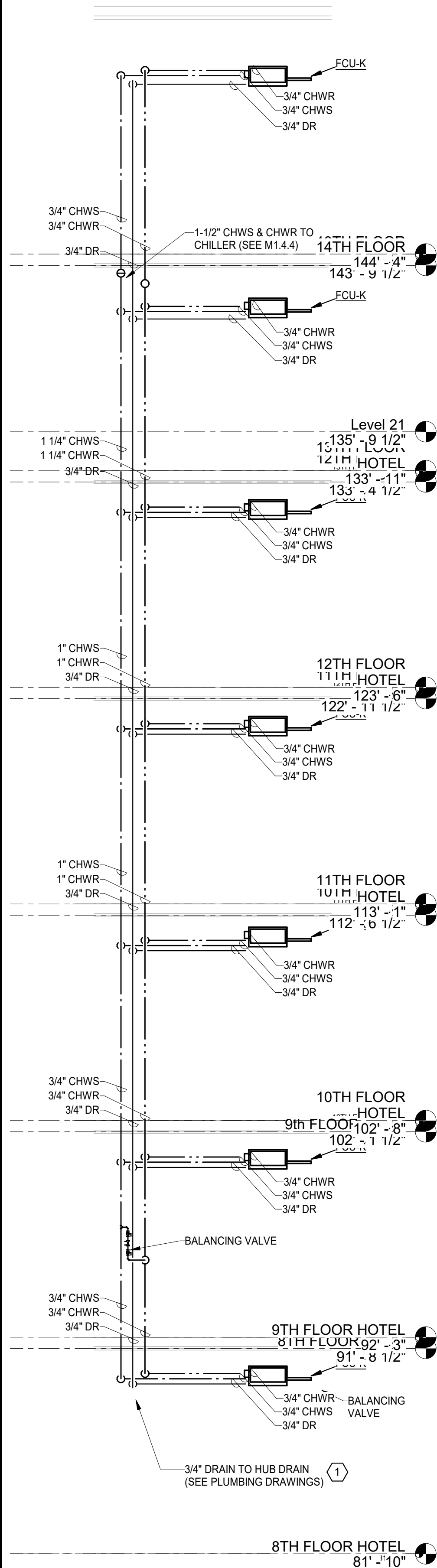


## MECHANICAL WATER RISER DIAGRAMS

## M8.3



**CONSULTING ENGINEERS**  
909 Poydras Street, Suite 2150  
New Orleans, Louisiana 70112-1034  
Tel. 504-586-1725



**# SHEET REFERENCE NOTES**

1 DRAINS MAY BE ROUTED TO PRIMARY STORM DRAIN SYSTEM AT CONTRACTORS DISCRETION. SEE PLUMBING DRAWINGS FOR NEARBY STORM DRAIN PIPES.

**HB SA II**  
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SINCE 1961

**HARD ROCK**  
1031 CANAL STREET  
NEW ORLEANS, LOUISIANA

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STATE OF LOUISIANA  
RAYMOND E. SMITH  
LICENSE No. 36823  
REGISTERED PROFESSIONAL ENGINEER  
MECHANICAL ENGINEERING

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REVISION HISTORY	
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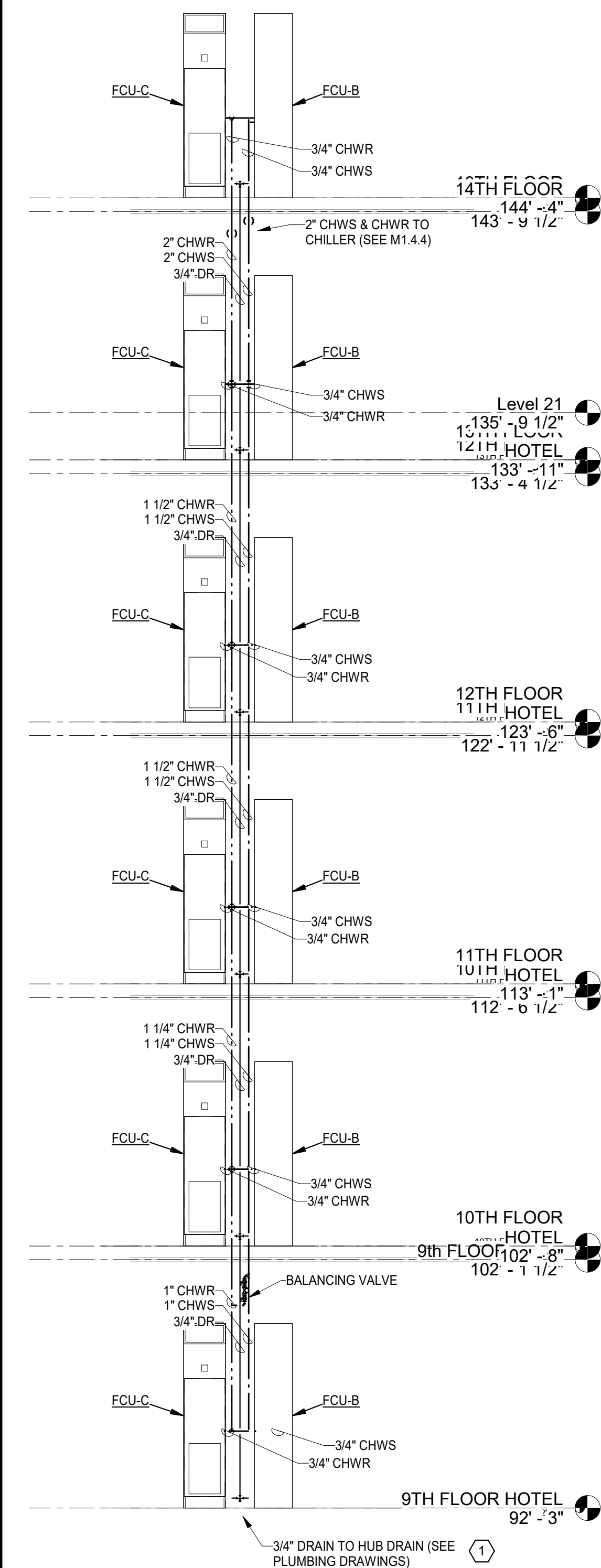
MECHANICAL WATER RISER DIAGRAMS

PROJECT#: 1709  
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TEAM: Author  
CHECKER: Checker  
SCALE: AS NOTED  
ISSUED: 06/05/2018

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New Orleans, Louisiana 70112-1034  
Tel. 504-586-1725

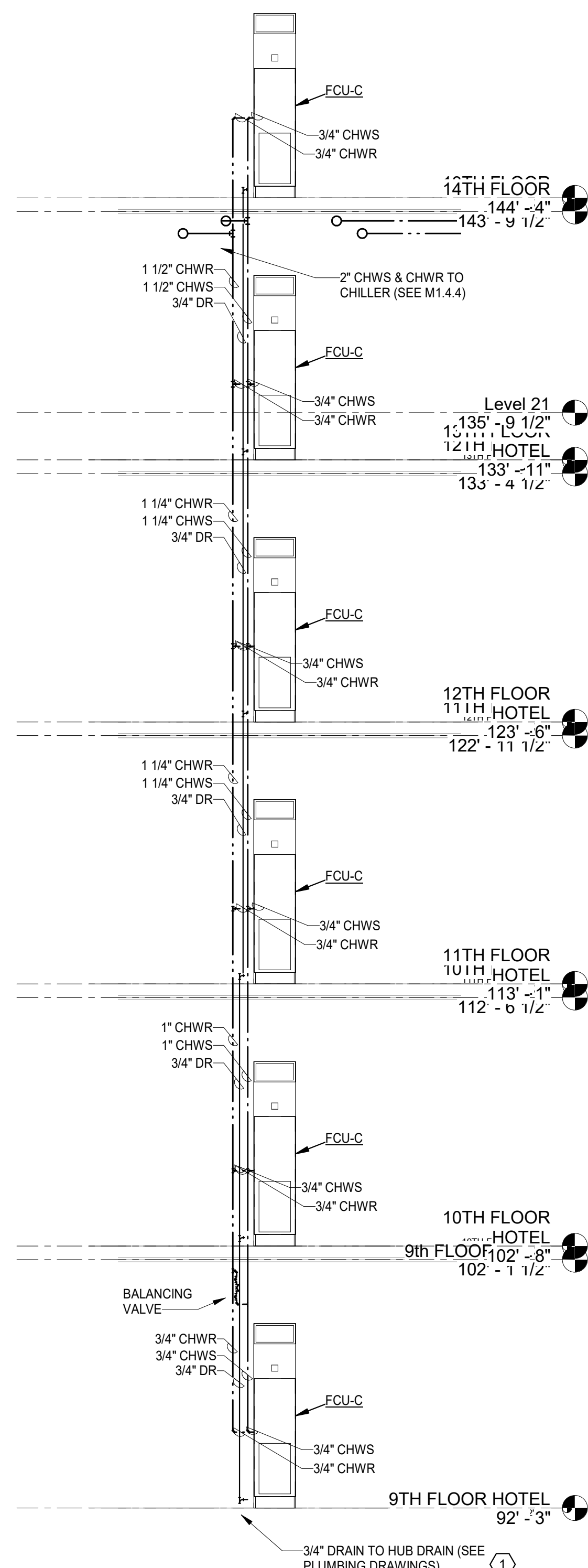
**M8.4**





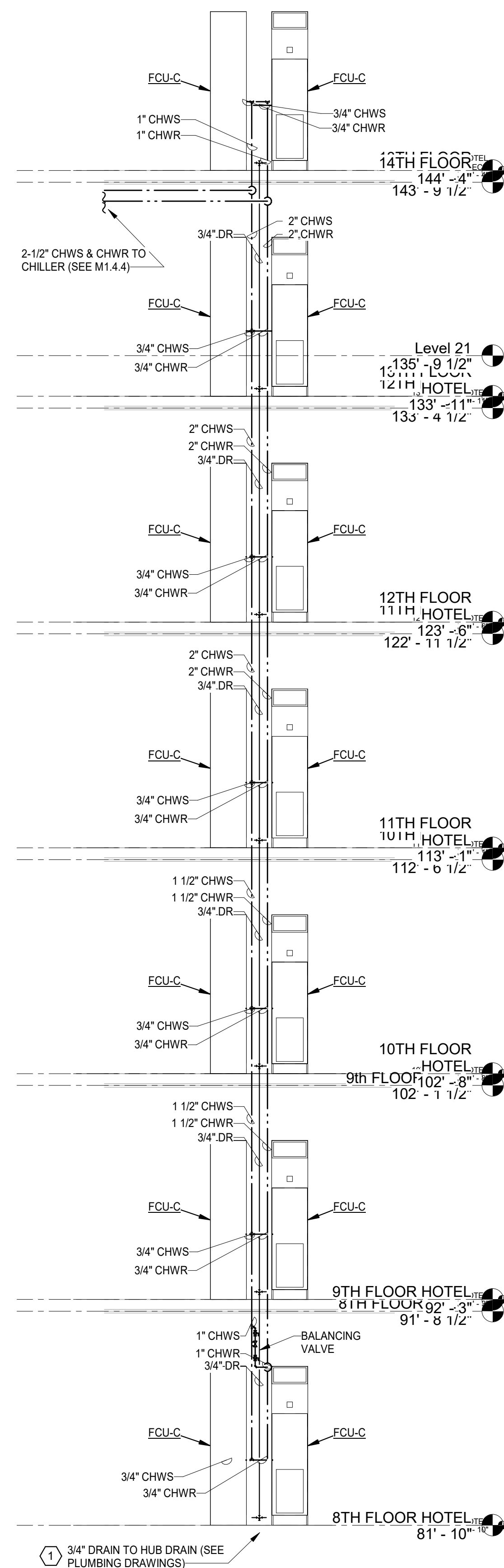
1 CHILLED WATER RISER 18

SCALE: 1/4" = 1'-0"



## 2 CHILLED WATER RISER 19

SCALE: 1/4" = 1'-0"



### 3 CHILLED WATER RISER 20

SCALE: 1/4" = 1'-0"

## # SHEET REFERENCE NOTES

- |   |   |
|---|---|
| 1 | DRAINS MAY BE ROUTED TO PRIMARY STORM DRAIN SYSTEM AT CONTRACTORS DISCRETION. SEE PLUMBING DRAWINGS FOR NEARBY STORM DRAIN PIPES. |
|---|---|

**HB** HARRY  
BAKER  
SMITH  
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**P L L C**

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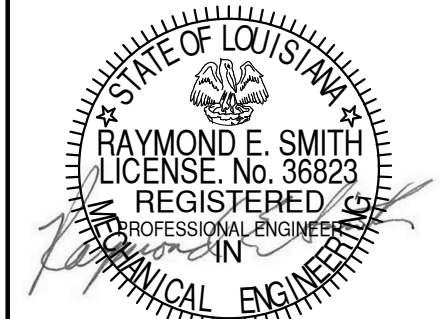
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[illegible]MECHANICALWATER  
RISER DIAGRAMS

PROJECT#: 1709

PHASE: PERMIT

TEAM: Author

CHECKER: Checker

SCALE: AS NOTED

ISSUED: 06/05/2018

**MOSES**  
ENGINEERS

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# M8.5